

RESPONSE TO THE
TECHNICAL REVIEW OF THE RFI
PHASE I REPORT, AND PHASE II WORK PLAN
ENVIROSAFE SERVICES OF OHIO
OREGON, OHIO
Dated October 20, 2003

PHASE I RFI REPORT

GENERAL COMMENTS

1. *The Phase I RFI Report does not contain the level of detail that is typically included in an RFI report. EPA has made an agreement with EnviroSAFE that the Interim RFI Report may be submitted as a "Stream-lined" document. The introduction should be revised to clearly indicate the contents, and to explain that a complete RFI report will be submitted following the completion of Phase II activities.*

ESOI had proposed a streamlined report to allow a more continuous field investigation program (similar to the reporting approach that USEPA has accepted on RFIs conducted under streamlined and voluntary corrective action agreements). A submittal of a streamlined report was approved by USEPA. However, the level of documentation requested by the agencies subsequent to the initial agreement for a streamlined report resulted in a much more substantial report than intended by ESOI. Finally, the level of detail being required to respond to this NOD leads this report further from a streamlined report.

Section 1 of the Phase I Report will be revised to clearly indicate the contents of the streamlined report, and explain that a complete RFI Report will be submitted following completion of the Phase II activities. The final RFI report will include the baseline human health risk assessment and screening level ecological risk assessment described in the RFI Work Plan.

2. *Section 4 of the Phase I RFI Report presents an evaluation of data collected during the reconnaissance and Phase I activities for seven solid waste management units (SWMUs) (1, 5, 6, 7, 10, 11, and 12), three areas of concern (AOCs) (2, 6, 10), and three investigation units (A, B, and C). For each SWMU, AOC, or investigation unit presented, the discussion is concluded with recommendations for the Phase II investigation based on the results of the reconnaissance and Phase I activities. The recommendations for groundwater include the installation of additional temporary and permanent wells to further delineate the lateral and vertical extent of constituents that exceed the Maximum Contaminant Level (MCL) / Drinking Water Equivalent Level (DWEL) criteria. In other cases, resampling was recommended where insufficient sample volume was available in the Phase I sampling event*

or to confirm the exceedences of the MCL/DWEL criteria.

However, the recommendation to resample existing wells to confirm laboratory analytical results is a concern. Resampling to confirm concentrations was recommended for five SWMUs (1, 5, 6, 7, and 10) and two investigation units (A and B), but was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. Resampling can also be justified to collect additional sample volume or to discern temporal trends in contaminant concentrations. However, resampling to confirm concentrations does not appear to be justified as a primary characterization method unless the Phase I analytical results appear suspect. In addition, interpretation of one round of resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. The Phase I RFI Report should be revised to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan. In instances where the Phase I results appear reliable, consideration should be given to the installation of an additional downgradient well to provide additional information on the lateral and vertical extent of contamination.

Page 4-2 of the Work Plan states that one element in the evaluation of the analytical data will be a qualitative review of the data including “consistency in the types of constituents found in all sampled media at each SWMU and AOC vis-a-vis expectations based on history of operations and chemical properties of the constituents, which may indicate potential for false negative or false positive identification of constituents”. Therefore, ground water resampling of certain well points will be conducted to confirm concentrations measured in Phase I. If the exceedances are confirmed, additional sampling and delineation will be proposed as necessary. If the exceedances are not confirmed, a third round of confirmation sampling will be completed for constituent(s) of interest to verify that further sampling is not warranted.

3. *The Remedial Facility Investigation (RFI) Phase I Report does not include a table that correlates the sample number with the sample location, and sample delivery group (SDG) making it difficult to evaluate the data. ESOI shall revise the RFI Phase I Report to include a table correlating the sample number with the sample location and SDG. Include a similar table in the Phase II Report.*

The data tables which were provided electronically with the Phase I Report show the sample number, sample location, date, and analytical results. A cross-reference table identifying the SDG for each sample will be included in the revised Phase I Report. Similar information will be provided with the Phase II Report.

4. *Section 3.2 discusses data quality objectives (DQOs). One of the objectives is to collect data to support development and evaluation of corrective measures alternatives. The RFI Phase I Report and Recommendations for Phase II Investigation fail to provide a narrative explanation of how the development and evaluation of corrective measures will be supported by the data collected during Phase I and the data that is proposed to be collected*

during Phase II. ESOI shall revise the RFI Phase I Report to include descriptive language to support the proposed Phase II sample locations, along with the objectives of sampling at the proposed locations.

Descriptive language supporting the proposed Phase II sample locations is included for each SWMU or AOC in Section 4.3 of the Phase I Report. To make the report more clear, this information will be moved to Section 5, Phase II RFI Work Plan.

As discussed in Section 1.2 of the RFI Work Plan, the overall goal of the RFI is to determine whether potential risks to human health and the environment associated with hazardous waste or hazardous constituent releases, if any, from the SWMUs and AOCs identified for investigation warrant corrective measures. This determination will be based on a baseline risk assessment which will characterize the potential risks from reasonable maximum exposures under current and reasonably expected future land and ground water uses at and near the Facility. The results of Phase I and Phase II of the RFI will be used to support the selection of corrective measures necessary to protect human health and the environment from unacceptable risks, if any.

5. *ESOI shall revise the RFI Phase I Report to include a Sample ID column and the associated Sample IDs for constituents listed on Tables 4.3a, 4.4a, 4.5a, 4.6a, 4.9, 4.10, and 4.11.*

The information shown on Tables 4.3a, 4.4a, 4.5a, 4.6a, 4.9, 4.10, and 4.11 includes a summary of statistics for the sampling results from each SWMU and AOC, including the number of samples analyzed for each constituent, the number of detections for each constituent, and the maximum and minimum concentration of each constituent. Individual sample results are shown on Tables 4.3b, 4.4b, 4.5b, 4.6b, and 4.12 through 4.15. These tables show the sample location and sample ID for each detected constituent at each SWMU and AOC which was present above the screening criteria in one or more samples at that SWMU/AOC.

6. *The following comments concern the dioxin and furan (CDD/CDF) analysis.*

1. *According to the Phase I Data Summary Table for CDD/CDF analytical results, dioxins and/or furans were detected at the Areas of Concern noted in the table below. Using factors obtained from a Research Triangle Institute report (RTI 1996) Ohio EPA was able to reproduce the toxicity equivalents that ESOI presented on Table 4.3a: Summary of Soil Screening Results for Detected Constituents, except as noted below. All results should be reproducible. Therefore, revise the RFI Phase I Report to include a discussion of how the CDD/CDF equivalents were derived.*

Area of Concern	Toxicity Equivalent Reproduced
AOC 2	No
AOC 6	Yes (max & min)

Area of Concern	Toxicity Equivalent Reproduced
SWMU 01	Yes (max & min)
SWMU 05	No
SWMU 06/07	No
SWMU 07/10	Yes (max & min)
SWMU 09/10	No
SWMU 10	Yes (min)

For twenty-two of the dioxin/furan samples, the 12 congeners cited in the Work Plan were used to calculate the 2,3,7,8-TCDD TEQ concentration. For the remaining eleven dioxin/furan samples, 5 additional congeners were inadvertently reported by the lab, and all 17 of the reported congeners were used to calculate the 2,3,7,8-TCDD TEQ concentration. Due to the timing of receipt of this EDD, ESOI determined that it would conservatively include the results from these additional 5 congeners in the 2,3,7,8-TCDD TEQ calculations. The calculation of 2,3,7,8-TCDD TEQs for all dioxin/furan samples used in the Phase I RFI Report is shown on Table GC 6a (attached). Additionally, Table GC 6b has been updated to include the data for the additional 5 congeners which were not reported in the Phase I RFI Report.

2. *The Phase I Data Summary Table for CDD/CDF analytical results indicates that the number in parentheses is the sample quantitation limits (SQL). Table 1-1f, Compound List for Dioxin and Furan Analysis, of the approved RFI Work Plan lists the estimated quantitation limits (EQL). ESOI shall revise the Phase I Report to describe the difference between the SQL and the EQL and include a discussion of why the SQLs are higher than the approved EQLs. Resampling and analyses for these compounds may be warranted.*

As requested, the RFI Report will be revised to include a discussion of the difference between SQLs and EQLs. Specifically, the EQL is the limit of quantitation defined to ensure a reasonable level of confidence in precision and accuracy of the measured concentration; the EQL is typically taken to be 5 to 10 times the MDL. By comparison, the SQL reflects adjustments to the preparation or analytical methods on a sample-specific basis (e.g., dilution, use of a smaller sample size) in order to analyze the sample. A specific SQL may be higher than, lower than or equal to SQLs for other samples.

See response to Specific Comment 8 regarding the significance of SQLs that are higher than the QAPP-specified EQLs.

7. *Ohio EPA split soil samples with ESOI at Millard Avenue Landfill (SWMU 5) locations T-20, T-21, and T-22. Due to delayed shipping to Ohio EPAs analytical laboratory, samples for metals analysis were the only samples that were analyzed within the required holding time. A review of the metals data indicates that, particularly for lead, ESOI's analytical results appear to be biased low. For several metals there was a relative percent difference*

(RPD) between Ohio EPA's result and ESOI's result, greater than 30%. ESOI shall use the highest detected value between Ohio EPA's data and ESOI's data in the cumulative risk assessment.

ESOI respectfully requests that Ohio EPA provide the data for all split samples it collected during Phase I of the RFI along with the associated QA/QC information for these data and all information required to comply with sections 4 through 14 of the RFI QAPP, so that ESOI can properly assess whether the Ohio EPA data in fact show that ESOI's data are biased.

ESOI does not plan to use only the highest concentrations in risk calculations, because such practice would be scientifically indefensible and inconsistent with regulatory guidance on risk assessment. According to USEPA risk assessment guidance (USEPA 1989), estimates of reasonable maximum exposures should be based on concentrations that represent the average concentrations to which a receptor population is expected to encounter over the long-term. As such, the use of only the highest concentrations is not required. In the case of split samples or duplicate samples, the average of the concentration pairs should be used if both concentrations are equally valid. This approach is inherent in the "representativeness" criterion discussed in the RFI QAPP and USEPA QAPP guidance.

8. *The RFI Phase I Report does not mention the intermittent pooling of water on top of Cell F (SWMU 1) and the New Oil Pond (SWMU 9). Pooling of water becomes evident when settlement caused by displacement of liquid and compressing of voids under the weight of material on top occurs. Depending on thickness of compressible layer(s), type of material and placement procedures, compression can continue for many years. The pooling of water on these SWMUs was evident during the on-site terrestrial habitat survey conducted on May 23, 2002, and is known by facility personnel to exist. In order to maintain the integrity of the landfill over time, properly designed landfills allow for water to be drained (via engineered slopes and ditches) from the landfill cap. Phase II of the RFI should include further investigation of the caps on SWMU 1 and SWMU 9 to better define the affected area(s), the rate of settlement, and the transition zones (differential settlement). Besides causing undesirable retention of water, settlement can damage components of the cap. ESOI shall revise the Recommendations for Phase II Investigation to include an investigation of settlement on SWMU 1 and SWMU 9 to ensure that these areas are addressed during the corrective measures study (CMS).*

The ponding or pooling of water on top of SWMU Nos. 1 and 9 is not a new phenomenon. Depressions on top of SWMU No. 9 may be entirely or in part due to differential settlement; however, ESOI was unable to obtain a leachate sample from SWMU No. 9 during the RFI implementation. This suggests that ponded waters on top of this SWMU are either not migrating vertically through the cover soils or that the consolidation of liquids during closure of the New Oil Pond was not complete, such that the consolidated waste mass is still capable of absorbing liquids. Information contained within the Description of Current Conditions for ESOI (Section 3, Page 3-3, Paragraph 3) dated March 23, 2001, indicates that the depression on SWMU No. 1 was constructed intentionally to maintain sufficient separation distance from overhead electrical wires within the Toledo Edison Easement above Cell F. Regardless, sufficient geotechnical data have been generated for the cover soils on these SWMUs to facilitate inclusion in the Corrective

Measures Study.

9. *Given that ESOI has proposed Phase II physical properties sample locations over the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9), it is assumed that ESOI intends on demonstrating that the internal haul roads are an adequate cap. If this is the case, provide a cross section of the road/cap utilizing the Phase I step out borings. If there is not enough data from Phase I, propose additional Phase II boring locations to complete this cross section.*

ESOI agrees that there are insufficient data to assess whether or not the on-site haul roads provide adequate cover material over newly identified waste disposal areas, and has for this reason proposed additional geotechnical sampling and analysis of the soil beneath these on-site haul roads as part of the Phase II RFI. Data generated from this proposed additional sampling and analysis will be presented in the Phase II RFI report and utilized during the Corrective Measures Study to evaluate what actions may be necessary. As a supplement to the Phase I RFI report, ESOI has prepared a cover-thickness isopach map based upon cover soil thickness data observed from soil borings installed during Phase I of the RFI. This cover-thickness isopach map is provided as Figure 1 with these responses.

10. *To aid in the interpretation of flow direction and plume extent in the upper till/ lower till contact zone, include a contour map of the lower till surface in the Phase II Report. The map shall specifically identify the location of upper till/lower contact wells that have sand deposits at the contact. The contours shall be based on well log data from all existing deep till and bedrock monitoring wells, including permitted monitoring wells, Phase I wells and Phase II wells.*

Ground water flow direction and contour maps will be provided with the Phase II Report.

11. *Based on the plumes identified during the Phase I investigation the current ground water monitoring well spacing is not adequate to meet the requirements of OAC Rule 3745-54-97(A)(2). This rule requires the ground water monitoring system to consist of a sufficient number of wells, installed at appropriate locations and depths to yield ground water samples that represent the quality of ground water passing the point of compliance. The current ground water monitoring system consists of well nests placed at the corners of each of the waste units. Phase I activities identified plumes along the southern, western and northern borders of SWMU 5; the northern border of Cell F (SWMU1); and the northern and eastern borders of SWMU 6. The releases from SWMUs 1, 5, and 6 appear to be broad releases along the entire lengths of the cell borders. To adequately monitor the quality of ground water passing the compliance point along these borders, additional well nests (shallow till, deep till, and bedrock) should be installed along these borders located about the middle of each unit.*

To meet the requirements of OAC Rule 3745-54-97(A)(2), submit a permit modification to

add the additional wells discussed above to the ground water monitoring program.

ESOI recognizes that non-naturally occurring constituents have been identified in monitoring wells installed to monitoring the lacustrine/upper till and upper till/lower till contact zones on the western and northern sides of SWMU 5; along the northern side of SWMU 1; and along the northern and eastern sides of SWMU 6. It is these data that form the basis for much of the proposed Phase II RFI. Based upon the review of the Phase I RFI data, a new permanent monitoring well nest has been proposed along the eastern side of SWMU 6 in the lacustrine/upper till and upper till/lower till contact zones.

A considerable amount of site-specific hydrogeologic and water quality data have been gathered by ESOI at this facility - none of which have confirmed any impacts to the underlying bedrock aquifer. Additionally, it has been consistently demonstrated that the net direction of groundwater movement within the carbonate bedrock aquifer is to the north; therefore, bedrock monitoring wells R-3 and R-8 provide adequate downgradient coverage to detect potential releases from SWMUs 6 and 7. The RFI data do not warrant the installation of another bedrock monitoring well along the eastern side of SWMU 6.

Similarly, the Phase I RFI data collected and reviewed in association with SWMU 1 do not support the request to install an additional monitoring well nest along this side of the unit. Additional sampling of the lacustrine/upper till and upper till/lower till contact zones has been recommended during the Phase II RFI due to the low yields encountered during Phase I and to confirm some Phase I RFI findings.

With regard to SWMU 5, permanent monitoring wells are proposed in the Phase II Work Plan along the north, west and south sides of SWMU 5, as detailed in the response to Specific Comment 51.

12. *Analysis results displayed in the data summary tables do not indicate that any constituents were detected below the estimated quantitation limits. The definition for the data qualifier "U" used in the tables is non detect. The "U" qualifier is followed by the sample quantitation limit (SQL) in parentheses, this may be indicating that the constituent was not detected at or above the SQL instead of the constituent not being detected at or above the method detection limit.*

The baseline risk evaluation requires all organic constituents detected below quantitation limits to be included in the risk evaluation using a value equal to one half of the SQL. To ensure that all organic constituents detected are included in the risk evaluation, revise the RFI Phase I Report to provide a list of all organic constituents that were detected above the method detection limit for each SWMU and AOC. For Phase II, analysis results for those constituents that are detected above the method detection limit but below the estimated quantitation limit shall be reported with estimated concentrations ("J" qualified). The Phase II report shall include a list of all organic constituents that were detected above the method detection limit during Phase I and II for each SWMU or AOC.

In accordance with the approved QAPP, any Phase I RFI constituent detected at a concentration between the MDL and the SQL are identified as being detected at an estimated concentration and

is noted with a “J” qualifier. All “J” qualified results are shown in the Electronic Data Tables which were provided on the compact disk distributed with each copy of the Phase I Report. In addition, all “J” qualified data were included in the data screening provided in the Phase I Report.

13. *During Phase I of the RFI, Ohio EPA split ground water samples with ESOI at monitoring wells BG-1D, BG-1R, T-5D, T-11D, T-20D, T-20S, T-37D, T-37S, and T-54S. Ohio EPA’s analysis detected organic constituents that were not detected by ESOI’s analysis. Some of the Ohio EPA detections are low, near or below the quantitation limit. However, all method blank analysis results are non detect and all trip blank results are non detect except for the trip blank for samples collected on November 13, 2003. The trip blank had acetone at 2.7 micrograms per liter (µg/l) and methylene chloride at 0.32 µg/l. This indicates that the low estimated concentrations detected in Ohio EPA’s split samples are real detections and are not the result of laboratory or field sampling conditions. The constituents detected in Ohio EPA’s analysis are listed in the table below.*

<i>Well ID</i>	<i>Constituents</i>
<i>T-5D</i>	<i>acetophenone; bis (2-ethylhexyl) phthalate; di-n-octyl phthalate; acetone; and benzene.</i>
<i>T-20S</i>	<i>bis (2-ethylhexyl) phthalate; phenanthrene; pyrene; and acetone.</i>
<i>T-37S</i>	<i>benzene; ethyl benzene, tetrahydrofuran, and toluene.</i>
<i>T-54S</i>	<i>acetophenone; di-n-octyl phthalate; benzene; tetrachloroethene; and toluene.</i>

In all data evaluations, screening and baseline risk assessment, ESOI shall use the highest analysis result of Ohio EPA/ESOI split sampling and analysis.

This comment appears to suggest that all the organic compounds listed in the above table were detected in the Ohio EPA split samples but were not detected in ESOI’s split samples. ESOI wishes to clarify that the following organic compounds listed above were detected in its split samples: bis(2-ethylhexyl)phthalate and phenanthrene at T-20S, tetrahydrofuran at T-37S, and acetophenone at T-54S. In addition, ESOI’s split samples detected 1,4-dioxane (0.138 mg/L at T-37S), which was not listed as detected by Ohio EPA.

ESOI disagrees with the conclusion made in this comment that the “concentrations detected in Ohio EPA’s split samples are real detections” because they were not attributable to laboratory or field sampling conditions. ESOI believes that these detections could be false positives that occurred naturally when USEPA’s analytical protocols were properly followed. According to USEPA’s analytical protocols (e.g., SW-846), the determination of whether an analyte is present in a sample is a statistical determination that has a 1% chance of error by design. In other words, there is a 1% chance of making a false positive determination for each analysis when the analytical protocols are properly followed.

When many analyses are performed, such as the more than 1,400 analysis done for the groundwater split samples discussed in this comment, the chances of getting a few false positives are quite high. Therefore, the detection of compounds in Ohio EPA's split samples that were not detected in ESOI's split samples, and vice versa, can be the natural outcome of performing many tests that have a small chance of a false positive for each test.

As noted in this comment, all the detected concentrations in the Ohio EPA samples were low, which is not inconsistent with the possibility that some or all of these detections are false positives. Also, some of the compounds detected in the Ohio EPA split samples were rarely, if ever, detected in any of the approximately 130 groundwater samples collected during the initial phase of the RFI (e.g., di-n-octyl phthalate and pyrene were never detected in any groundwater sample). This observation also suggests that some or all the detections in the Ohio EPA split samples could be false positives.

Finally, some of the concentrations detected in Ohio EPA samples are higher than solubility limits. In particular, the bis(2-ethylhexyl)phthalate concentrations at T-20S are more than 10-fold higher than the solubility limit. These unusually high and low results are some of the reasons that ESOI is requesting the opportunity to review the QA/QC documentation associated with the sample collection, preparation, and analysis for the Ohio EPA split samples. Please also see response to General Comment 7 regarding the use of Ohio EPA split sampling data.

ESOI believes that the most appropriate approach for determining whether the compounds detected by Ohio EPA and not ESOI are actually present or are false positives is to resample the monitoring wells for these analytes during the next phase of RFI field work. This approach is consistent with USEPA groundwater monitoring regulations at 40 CFR Part 264, Subpart F, which recognize the same potential for false positives and allow for resampling to confirm the presence of a compound.

14. The September 2002 Progress Report, dated October 14, 2002, indicates that the following Shelby Tubes were re-collected during the reporting period:

- a. S-F20C7P1-052902-RLB-029 from SWMU No. 8;*
- b. S-F20C7P1-052902-RLB-31 from SWMU No. 8;*
- c. S-F20C7P1-071602-NAB-029 from SWMU No. 5;*
- d. S-F20C7P1-071602-NAB-030 from SWMU No. 5;*
- e. S-F20C7P1-071602-NAB-031 from SWMU No. 1;*
- f. S-F20C7P1-071602-NAB-036 from SWMU No. 1;*
- g. S-F20C7P1-071702-NAB-042 from SWMU No. 7; and*
- h. S-F20C7P1-071702-NAB-044 from SWMU No. 7.*

Neither the Progress Report or the RFI Phase I Report offer an explanation for the need to recollect the samples. ESOI shall revise the RFI Phase I Report to explain why these samples were re-collected and how that may effect making an accurate determination of the thickness of cover material.

Also, Table 4.1 provides a summary of the geotechnical data but does not indicate how it was determined that the RFI cap thickness criteria was met. The lab data sheets for geotechnical samples were provided in the November 2002 Progress Report, dated December 12, 2002. The data sheets indicate that none of the recovery results for the intervals sampled either met or exceeded 2 feet. In addition, many of the data sheets do not list the recovery. Provide an explanation of how it was determined that the RFI cap thickness criteria was met.

Finally, Ohio solid waste landfill requirements (Ohio Administrative Code 3745-27-08(D)(26)) give a minimum soil cap depth of 36 inches for counties along Lake Erie as a protection against freeze thaw damage. ESOI should comply with this minimum cap depth for the same reasons it is a solid waste requirement in Ohio (to ensure long term cap integrity) and because this depth is adequate to eliminate most potential eco-receptor contact with waste materials (which would have to be characterized to assess exposure with shallower cap depths). Additionally, as the guidance implies, ESOI should attempt to achieve greater precision when characterizing cap depths in these areas. Measuring a minimum number of points only to the nearest foot (instead of inches) leaves a likelihood that cap depths in some areas are significantly less than the reported values. Areas reported as having 2 feet (or 3) feet of cap thickness require additional measurements and/or fill to verify they meet minimum cap thickness. The additional cap material added should inversely correlate with the number of confirmation cap measurement locations (i.e., if ESOI chooses to assess cap depth in less locations, then more cap material depth should be added to assure the 36 inch minimum is met). If extra soil is warranted it should be applied following general landfill engineering principles (e.g., adequate compaction, slope, etc.).

The August 2002 RFI Progress Report dated September 12, 2002 states that: "Several of the geotechnical soil samples did not maintain their integrity upon extrusion from the Shelby tube samplers." Furthermore, the August 2002 RFI Progress Report states that: "ESOI is evaluating whether or not to have the samples re-molded, or whether to re-collect the geotechnical soil samples for permeability testing." The SWMU cover thicknesses were determined during soil boring installation and Shelby tube soil sample collection on the landfill units and remain unaffected by this re-sampling effort. Notes regarding the landfill cap thicknesses are included in the soil boring logs and field notes in Appendix C of the Phase I RFI report.

An action level of 2-foot minimum thickness for conducting further investigation of the landfill cover conditions as well as the number and general locations of soil borings were agreed upon with USEPA and Ohio EPA in the approved RFI Work Plan. Further, the 36-inch thick cover thickness as prescribed within Ohio Administrative Code 3745-27-08(C)(15)(d) is a current closure requirement for new landfill facilities near Lake Erie. SWMUs 1, 5, 6, 7, 8 and 9 were all closed in the 1980s in accordance with then-applicable guidance and regulations. ESOI is unaware of any other closed solid waste landfill within the State of Ohio which has retroactively been required to meet this performance standard. A final determination on what, if any, additional work is required for these closed landfills will be developed as part of the CMS.

15. *During Phase I of the RFI, ESOI investigated landfill gas at Cell F (SWMU 1), Millard*

Avenue Landfill (SWMU 5), the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7), and the New Oil Pond (SWMU 9). In each of these cases ESOI indicates that "given the thickness of the existing cap is reasonably expected to mitigate any significant vapor migration, no further investigation of organic vapor levels is warranted." Explosive gas readings at these units exceed the RFI screening level by many times and explosive gas vents are only present at SWMUs 5 and 6. Given these findings, it is not clear that there is enough venting to ensure that lateral gas migration is not a concern and will not be a concern in the future. ESOI shall revise the Recommendations for Additional Investigation to include additional landfill gas investigation at SWMUs 1, 7 and 9. Also, see the specific comments below.

As reported in the Phase I RFI Report (see Table 4.2), initial explosive gas readings exceeded the combustible gas screening level only at existing monitoring points at MP-13 located at the northwest corner of SWMU 5 and PB-3 located north of SWMU 6. Organic vapor readings at these existing monitoring points were all below the screening criteria. Explosive gas readings taken at the soil borings drilled into SWMU 1, 5, 6, 7, 8 and 9 were all below the screening criteria. However, it is noted that VOC measures (as reported on the organic vapor analyzer) were above the screening criteria of 50 ppm. These data do not indicate a significant level of explosive gas generation or migration of VOC vapors. Rather, it does indicate that organic vapors are present in the wastes contained in these SWMUs. These data do not suggest that further investigation of explosive gas generation is warranted. However, the data do suggest that health & safety planning of intrusive activities at these units should account for the potential for volatile organic vapors to be present.

Nonetheless, to address the agencies concern regarding the potential for gas generation in these units, the RFI Phase II Work Plan will be revised to include additional monitoring at existing monitoring probes and installation of one vapor monitoring probe within SWMUs 1, 5, 6, 7, and 9, and one additional gas monitoring probe along the west side of SWMU 5, north of MP-13 near temporary point T-22S. These new monitoring probes and existing monitoring probes where elevated readings were reported during the Phase I RFI will be monitored for explosive gas and VOCs on a monthly basis throughout Phase II of the RFI to obtain additional data which will be used to evaluate and design, if necessary, corrective measures (e.g., installing passive vents) to address gas generation and migration from these units. This additional monitoring will be conducted in conjunction with the monthly monitoring which is currently ongoing along the north side of SWMUs 1 and 6 and the west side of SWMU 5 as part of ESOI's approved Explosive Gas Monitoring Plan.

16. *ESOI should submit an overall analysis of data, providing a holistic means of evaluation, to assess useability of sample results. This includes assessment of laboratory quality control (QC) problems (e.g., half or more of surrogates are outside laboratory established limits - or for SVOCs, surrogates evaluated by fraction), exceedances of recommended holding times, etc. and these should be linked with the purpose of the sample. For example, if a sample has poor surrogate recovery but is supposed to demonstrate the extent of contamination, it is less likely that the sample results can be considered acceptable. This summary/ analysis should include numeric recovery percentages linked with laboratory quality assurance/quality control (QA/QC) limits to clearly demonstrate how far out of*

limits the recoveries were (as opposed to subjective assessments like “slightly” out of limits - as the data validation summaries include now) as well as clear documentation of holding times and exceedances (as compared with NFGs and the laboratory’s QAPP). Also, if a sample is “J” qualified more than one time, the end result may be that the sample results are enough in doubt that they should be rejected.

Data validation and reporting were conducted in accordance with the Quality Assurance Project Plan (QAPP) as contained within Appendix A of the approved RFI Work Plan. Section 3.0 of the Phase I RFI report contains an overall summary of the data validation results. Detailed information regarding the data validation results were provided within the individual data validation reports prepared for each sample delivery group and provided within Appendix F of the Phase I RFI report. Combined, these documents provide an overall means of evaluating and assessing the usability of the data. Furthermore, it must be understood that in addition to prescribed procedures, the data validation process relies heavily upon the professional judgment of the person or persons responsible for validating the data. In every case, the data were appropriately qualified in accordance with the project-specific QAPP, referenced guidance and the "Validator's" professional judgment. Once qualified, it is the responsibility of the user of the data to determine the acceptability of the data for its' intended use.

17. *Qualifying data should also factor in results of matrix spike/matrix spike duplicate (MS/MSD) samples especially when these QC samples are performed on samples from the same ESOI Sample Delivery Group (SDG) or when other QA/QC samples indicate a problem with the same analyte(s) or compound(s). This is particularly important when an MS/MSD indicates a problem with recovery of an analyte known to be present in the associated field sample or present in other samples from that SWMU/AOC. The data validation summaries indicate that “qualifiers were not added to the data results based solely on matrix spike and matrix spike duplicate results” but do not make it clear how these results were used in an overall assessment of samples. For example, if the same compound was within limits in the associated laboratory control sample (LCS) sample and surrogate recoveries were within limits for other samples in that analytical group, it could more confidently be assumed that difficulties were limited to matrix of the sample associated with the MS/MSD.*

Data quality review was completed in accordance with the guidance documents referenced in the QAPP attached as Appendix A to the approved RFI Work Plan, which states that data quality should not be based solely on MS/MSD results. The use of MS/MSD data as it relates to data quality was addressed within the individual Data Validation Memoranda issued with each sample delivery group (Appendix F of the Phase I RFI report) and was only one of the factors utilized by the data Validator in assessing the overall confidence in, and usability of, the data.

18. *ESOI should clarify that after the Phase II data has been collected, properly validated, and determined to be complete (based on additional samples to supplement gaps in determination of nature and extent, where indicated; completeness of acceptable samples and laboratory analysis for all units; acceptable populations for statistical evaluation; etc.) for each SWMU and AOC, then the human health and ecological risk assessment can be*

completed.

As discussed in Section 4.1 RFI Work Plan, data collection will be conducted in phases. After each phase, adequacy of the data to meet these RFI objectives will be evaluated to determine whether additional data collection is warranted. When data of sufficient quality and quantity have been collected, the data will be used to support decisions regarding the need for interim or corrective measures. These decisions will be based, in part, on the findings of a baseline human health risk assessment and an ecological risk assessment to be completed after the field investigation phase of the RFI.

Section 1 of the Phase I Report will be revised to reiterate that a baseline human health risk assessment and an ecological risk assessment will be conducted following the completion of necessary field data collection activities. See response to General Comment 1.

19. Habitats and associated receptors were eliminated without adequate justification. Despite the lack of success trapping small mammals during the investigation, many areas at ESOI are likely habitat for significant numbers of small mammals or other prey species which are in turn potential food for higher trophic levels. ESOI should evaluate the likelihood that contaminants could bioaccumulate from invertebrates (i.e., earthworms) to small mammals/birds to higher trophic levels at significant levels. Contaminants with potential to bioaccumulate should be evaluated based on concentrations present in surficial soils down to three feet. The amount of surface soil sampling is insufficient to assess surficial contaminants (particularly for SWMU 6 where cover soils are less than three feet). ESOI shall revise the Phase II Work Plan to include additional surface soil sample locations. If the total number of valid samples is less than 12 per unit, maximum concentration levels should be used to assess potential risk.

The agency is indicating a level of ERA evaluation that was not contemplated as part of the Phase I RFI investigation. An ERA will be conducted after the completion of supplemental field sampling activities designed to fill data gaps and reduce uncertainties in the risk assessment. Comments pertaining to the appropriate approach to evaluation of chemical bioaccumulation and food web will be considered after the completion of Phase II sampling activities and the implementation of ERA activities.

In addition, sample density was completed in accordance with the approved RFI Work Plan. Notwithstanding, ENVIRON and USEPA have agreed that in cases where a representative exposure concentrations is being used (e.g., 95% UCL on the mean), that a minimum of 8 samples will be necessary (for fewer samples, these would be justified on a case-by-case basis). See response to General Comment 14 regarding adequate SWMU cover thickness.

20. It is unclear what cutoff ESOI is using for exceedances of ecological data quality levels (EDQL, a.k.a ESLs). Where maximum concentrations exceed EDQLs (or Ohio Water Quality Criteria) in a unit (e.g., mercury in the creek), reasoning for going forward or not doing so in the ecological risk assessment (ERA) process must be addressed (e.g., if only one sample of a significant number exceeds an EDQL by a limited margin for that media in

that unit, that may be justification for not continuing the process for that unit) and presented in a format transparent to the public. The purpose of screening levels is to screen out compounds below those levels, any difference from this process must be clearly documented and justified. In some cases multiple contaminants that may have similar effects exceed EDQLs (e.g., metals or PAHs in sediment samples in Table 4.12). Also, EDQL levels should be adjusted for the presence of multiple chemicals (e.g., divide the EDQLs by the number of PAHs or alternately, sum the ratios of each maximum PAH concentration to its corresponding EDQL and evaluate the resulting sum).

Clarification of the screening process used to evaluate CPOECs will be provided as part of the revised Phase I Report and Phase II Work Plan. The approach used for screening contaminants of potential ecological concern was consistent with the RFI Work Plan accepted by the USEPA. As defined in the Work Plan, during the initial screen, the maximum measured concentration in various media was compared against the EDQLs. Because the EDQLs were exceeded, ESOI used alternative screening benchmarks agreed to by the agency to further evaluate chemical levels in soil, sediment, and surface water. ESOI requests specific guidance and precedence describing the approach to adjusting EDQL values for multiple chemicals that may have similar effects in wildlife.

21. *Section 4.5.1.1 and Appendix E, Ecological Report. The report attempts to delineate wetlands on-site and in the immediate area, to evaluate the quality of these wetlands using the Ohio Rapid Assessment Method (ORAM), and to document receptors present in these areas. However, the sediments from these areas were not sampled. Some of these areas (e.g. to the north and east of cells H & I) have ecological receptors (i.e., frogs, turtles, birds) that not only could be exposed to contamination if present and could expose higher trophic level organisms to persistent, bioaccumulative and toxic (PBT) compounds, but also could serve as an attraction to any trespassers on the site. Given the ability of sediment to act as a sink for contaminants, storing them for long periods of time, proper characterization of this potential exposure pathway is important. Even though these wetlands are not large in area, having complete information regarding the type and amount of any contamination will allow proper assessment of any potential risk (i.e., higher concentrations of contaminants, if present, and the presence of various prey species could compensate for smaller areas and pose a risk to higher trophic levels).*

We disagree with the agency regarding the characterization of some areas of ESOI as valued ecological resources that warrant further investigation. The areas at ESOI were classified using the ORAM scoring system as category 1 wetlands, which are defined as being the least viable habitat for wildlife. These areas are located in the midst of an active industrial property and are not intended to encourage or sustain wildlife. Furthermore, during the problem formulation phase of the assessment, no relationship was found between certain ecological receptors and site-related stressors. As detailed in the DOCC, sampling did not take place at areas that represent incomplete exposure pathways. *The Survey of Existing Terrestrial and Aquatic Habitats Associated with the RCRA Facility Investigation* (Mannick and Smith Group, 2003) found not only limited habitat for birds and mammals, but also did not observe any birds or mammals foraging within the areas that were eliminated from consideration as valued ecological resources. Nests were not found in any of the areas for either birds or mammals. Because of these

observations the potential for bioaccumulative contaminants to be a factor in the assessment is negligible. With regard to SWMUs 3 and 4, USEPA and Ohio EPA approved removing both areas from consideration in the RFI investigations based on the existing information which did not indicate any evidence of a release from these units (and thus, there is an incomplete pathway).

22. *Revise the Phase II Work Plan to state that maps and cross sections showing the full vertical and horizontal extent of contaminant plumes will be included in the Phase II Report. In the Phase II Report plume boundaries shall be defined for areas exceeding risk and areas exceeding background. Risk boundaries and full extent boundaries (nondetect for nonnaturally occurring constituents and statistically above background for naturally occurring constituents) must be supported by well data. This may require the installation, sampling, and analysis of multiple step out wells prior to having sufficient data to complete the Phase II Report. Boundaries off ESOI's property may be supported by modeling (e.g., Modflow/MT3D) if evidence is provided that access to adjacent property has been denied. If access to adjacent property is denied the adjacent property owner needs to be informed of potential liabilities from inhibiting the investigation of the contaminant plumes.*

The Phase II Work Plan will be revised to indicate that maps and cross sections showing the extent of contaminants exceeding the relevant screening criteria will be provided in the Phase II Report.

SPECIFIC COMMENTS

1.3 Project Description

1. *Pages 2 and 3 list the AOCs and SWMUs considered in the RFI. Although EPA and Ohio EPA have approved SWMUs 2, 3, and 4 and AOC 11 from RFI investigations, the Phase I RFI Report does not provide adequate justification for excluding these SWMUs and AOCs from consideration in the ERA. Appendix E of the RFI indicates that these areas may provide habitat for ecological receptors, and the rationale for excluding these areas from the ERA should be provided in the Work Plan; it is not adequate to simply state that habitat is not present. The specific habitat characteristics of each site should be summarized and their absence of habitat value discussed. The rationale for excluding the wetland areas in SWMU 6 is also not adequately explained in the Phase I Report (e.g., Table 2.2). Table A, below, provides a summary compiled from Table 2.2 of the Phase I Report and identifies concerns with each AOC, SWMU, and Investigation Area (IA). Table A below has been provided to summarize the RFI ecological determinations and EPA's ecological concerns for each area. The Phase II RFI Work Plan should be revised to address each of the "Potential ERA Concerns" listed in Table A below.*

TABLE A Summary of SWMU and AOC Ecological Risk Concerns¹				
Area²	Description	Phase I Habitat Findings	Phase I ERA Screening	Potential ERA Concerns
SWMU 1	Landfill Cell F	no habitat	N soil runoff and GW	*no contaminants on soil analyte list
SWMU 5	Millard Rd Landfill	no habitat	N and W soil runoff and GW; ditch sediment	
SWMU 6	N Sanitary Landfill	wetlands	soil runoff and GW (north side)	*only one soil sample *no screening of wetlands ³ *GW not listed
SWMU 7	Central Sanitary Landfill	no habitat	none	*no screening ⁴
SWMU 10	Ash disposal area	aquatic habitat	see IA C below ⁵	see IA C below ⁵
SWMU 11	Former Teepee Burner	no habitat	none	*no screening ⁴
SWMU 12	Bill's Rd Oil Operation	no habitat	none	*no screening ⁴
AOC 2	Truck Scale	aquatic habitat	see IA C below ⁵	see IA C below ⁵
AOC 6	Oil waste ASTs	no habitat	none	*no screening ⁴
AOC 10	Rail spur	no habitat	none	*no screening ⁴
Investigation Area (IA) A	SWMU 8; AOCs 3, 4, 5, 7, and 8	no habitat	none	*no screening ⁴
IA B	SWMU 9; AOC 1	no habitat	none	*no screening ⁴
IA C	AOC 9; outfalls; Otter Creek	aquatic habitat	*SW or SW and sediment	
<ol style="list-style-type: none"> Derived from Table 2.2 of the Phase I Report. Tables 3A to 3F contain the specific analytical data but these tables could not be located. Only areas investigated in the Phase I RFI are listed in this Table. Table 2.2 states that wetlands are not impacted per "DOCC." Absence of impacts has not been adequately documented in the Phase I Report. Contaminant screening was not performed because the Phase I Report states that no habitat is present. Absence of habitat has not been adequately documented. Potential ecological impacts were investigated only by evaluating outfall samples under the IA C assessment. 				

As documented in the approved DOCC, no evidence of release was found at SWMUs 2, 3 and 4.

This documentation provided the basis for excluding these areas from further evaluation in the RFI (and associated ERA). A more complete documentation of site conditions (including a summary of the information previously provided in the DOCC), potential impact to wetlands from site activities, and the rationale for not identifying certain areas of ESOI as valued ecological resources will be included in the ERA. A screening level ERA will be conducted after the completion of supplemental field sampling activities designed to fill data gaps and reduce uncertainties in the risk assessment. Comments pertaining to the appropriate approach to evaluation of habitat in different areas of ESOI will be considered after the completion of Phase II sampling activities and the implementation of ERA activities.

1.5 Scope of Phase I RFI Activities

2. Page 6 states that a risk-based approach was used to determine additional investigations

and potential interim measures, but an ERA was not performed. As indicated in Section 4.3.2 of the Work Plan, a screening-level ERA was to be performed as part of the Phase I RFI. It is unclear what the scope of the ERA will be and when this will be performed.

The RFI Report will be revised to clarify that a scoping ecological evaluation was performed to support the identification of data gaps for conducting a site-wide ERA for ESOI. A screening level ERA will be conducted after the completion of supplemental field sampling activities designed to fill data gaps and reduce uncertainties in the risk assessment. If the results of the screening level analysis indicate that a more detailed assessment of ecological risk is appropriate, then a Work Plan will be prepared for agency review before proceeding, as indicated in the Phase I Work Plan.

2.1.1.3 Hydrogeologic Survey

3. *Page 9 introduces Figures 2-1 and 2-2 as the results of the water level survey designed to determine groundwater/surface water interactions. The Phase I RFI Report presents conclusions on potential hydraulic connection between shallow groundwater and Gradel Ditch and Otter Creek. However, the water level elevations presented in Figures 2-1 and 2-2 are not contoured, which makes review of the hydraulic relationships difficult. The water level elevations in Figures 2-1 and 2-2 should be contoured to more effectively highlight the conclusions presented on Page 9. In addition, the groundwater elevation data should be provided as a separate table in this report and future reports.*

Ohio EPA has previously recognized the fact that water-bearing zones above the uppermost aquifer at the ESOI site are not hydraulically interconnected and regularly accepts non-contoured potentiometric surface maps for these zones as part of the facility's on-going groundwater monitoring program. Given the low permeability nature of these zones and lack of interconnectivity, placing contours on the maps will be a meaningless exercise. ESOI instead proposes to complete monthly monitoring of the uppermost water-bearing zone (i.e., temporary water table wells and the lacustrine/upper till contact zone); Otter Creek, the Gradel Ditch, and Cells G, H and M storm water detention basins; and site-specific precipitation records during the performance of the Phase II RFI to assist in evaluating potential interactions between shallow groundwater and surface waters at the facility.

2.1.2 Phase I Investigation Overview

4. *The Phase I Report should briefly summarize the rationale for the selection of analytes in each SWMU, AOC, or IA or cite the specific section of the Phase I Work Plan where this information is provided. Because the tables only display detected constituents rather than the entire analyte list with the detection limit for those non-detects, it is difficult to determine which samples were analyzed for what chemical classes. Revise the Phase I Report accordingly.*

The rationale for the selection of analytes in each SWMU, AOC, or IA is provided in Section 3.2.2 and 3.4 of the RFI Work Plan. Tables showing the entire analyte list with the detection

limits for all analytes are provided in the Electronic Data Tables on the compact disk distributed with each copy of the Phase I Report.

2.1.2.2 Background Sampling

5. *Page 12 indicates that soil, groundwater, sediment, and surface water samples were obtained from background locations. However, the Phase I Report does not discuss how or why these locations were selected. Specifically, the text indicates that background soil samples were taken from an area that "has not been used for waste handling activities;" however, given that this area is on site, as illustrated in Figure 2-3, it is unclear whether this area may have been impacted by site related activities via fugitive dust or incinerator deposition. Surface water and sediment background samples were collected "upstream of ESOI's discharge points," but the sample locations are not provided in a figure. Therefore, it is not possible to assess the potential for contaminated groundwater to discharge at locations "upstream" of site-related point sources. The Phase I RFI Report should be revised to include an assessment of whether the background soil sample locations could potentially be impacted by fugitive dust or incinerator deposition. Additionally, an assessment of whether the surface water and sediment sample locations reflect background conditions should be included. The location of the surface water and sediment background samples should be illustrated on a figure and discussed in terms of groundwater flow direction as illustrated in Figures 2-1 and 2-3. Based on these assessments, additional background sampling and analysis may be warranted.*

Additionally, ESOI should refer to EPA's latest background guidance entitled, Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, OSWER Directive 9285.7-41, EPA 540-R-01-003, September 2002. ESOI should provide a discussion on background conditions and whether site concentrations are elevated over naturally occurring levels, to determine whether background concentrations had been impacted by site-related activities. It is suggested that a screening table displaying background concentrations and the screening process be included in the RFI Phase I Report. If a Hazard Index (HI) exceeds one, or the target risk (TR) exceeds a defined goal, then that contaminant should be identified and discussed in the risk assessment.

Considerations relating to the selection of background sampling locations were discussed in the approved RFI Work Plan. All background soil, ground water, sediment and surface water samples were collected from locations that meet the criteria specified in the approved RFI Work Plan and all locations were approved by Ohio EPA staff in the field prior to sample collection. These locations were chosen because they are not known to have been affected by site activities, and the Phase I RFI data from these locations do not suggest otherwise.

As shown on Figure 2-3 of the Phase I Report, the background soil samples were not collected at the ESOI facility, but rather from a nearby property east of the facility where no waste handling activities are known to have occurred. Further, based on the 1991-1995 wind rose provided in the DOCC, the primary wind direction is from the southwest, which makes it unlikely that the background soil sampling locations would be impacted by fugitive dusts from the ESOI facility.

The locations of the four surface water and sediment background samples are shown on Figures 4.7-1 through 4.7-3 of the Phase I Report. These four locations are between approximately 300 and 2800 feet upstream of York Street storm sewer discharge. The York Street storm sewer conveys both storm water discharges from the ESOI Facility (from Outfalls 002 and 006) and storm water runoff from York Street and neighboring properties. This discharge location is the furthest upstream location where the potential for impacts from the ESOI facility exists.

The background surface water and sediment sampling locations also are not affected by the discharge of groundwater from the ESOI facility. Shallow groundwater that may move from the ESOI facility in the direction of Otter Creek does not flow in the direction of these sampling locations. A discussion of shallow groundwater flow direction relative to these locations will be added to the Phase I Report.

ESOI will include calculations of the cumulative cancer and noncancer risks associated with the site-specific background concentrations and present these non-site-related risks in a new table that will be added to the Phase I Report.

2.2 Ecological Survey Activities

6. *Page 13 and Table 2.2 provide a cryptic summary of the results of the ecological investigation, and Appendix E of the Phase I Report summarizes the approaches and survey results of the qualitative ecological investigation. Table 2.2 states that a number of SWMUs, AOCs, and IAs were not “ecologically relevant,” but documentation of this determination is not provided in the Phase I Report. Neither Table 2.2, the main text of the Phase I Report, or Appendix E provide an area-specific determination and rationale for excluding a specific SWMU, AOC, or IA. Field forms are provided in Appendix E, but ecological relevance is not specifically addressed. It is unclear what criteria, if any, were used in determination of an absence of ‘ecological relevance’ and a determination of no further investigation. Revise the report to provide the specific rationale for determining that any SWMUs, AOCs, and IAs were not ecologically relevant. It is not adequate to only state that habitat was not present.*

A scoping ecological evaluation was performed to support the identification of data gaps for conducting a site-wide ERA for ESOI. A more complete documentation of site conditions, potential impact to wetlands from site activities, and the rationale for not identifying certain areas of ESOI as valued ecological resources will be included in the ERA.

4.2 Evaluation of Need for Additional Investigation

7. *Page 19 states that “ecological risk-based screening levels” and “ecological risk assessment principles” are used to evaluate data and support decisions regarding the need for further field work. The Phase I Report does not present an ERA in accordance with current EPA guidance as discussed below. Specific concerns include only considering detected compounds, excluding compounds based on background comparisons, not considering areas of potential habitat, not performing an ERA uncertainty analysis, and not*

considering the magnitude or spatial extent of ecological risks. Page 4-13 of the Phase I Work Plan stated that a screening ERA will be conducted according to the current EPA guidance, including the 1997 EPA Guidance. A screening ERA was not presented in the Phase I RFI Report, in apparent conflict with the Phase I Work Plan. The 1997 EPA Guidance and EPA guidance issued in 2001, The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments (2001 EPA Guidance), provide the specific requirements for identifying contaminants of potential concern (COPCs) in a screening-level ERA. Revise the Phase I Report to provide a screening ERA in accordance with the 1997 EPA Guidance and 2001 EPA Guidance and as specified in the Phase I Work Plan.

A screening level ERA will be conducted after the completion of supplemental field sampling activities designed to fill data gaps and reduce uncertainties in the risk assessment. If the results of the screening level analysis indicate that a more detailed assessment of ecological risk is appropriate, then a Work Plan will be prepared for agency review before proceeding, as indicated in the RFI Work Plan.

4.2.2.2 Quantitative Comparison to Human Health-Based Screening Levels

8. *Pages 23 and 24 identify the screening criteria used to evaluate media-specific concentrations. It is unclear whether all analytes were evaluated using the screening criteria, or only those constituents with actual detected concentrations. Because the tables only list detected constituents, it is difficult to interpret whether all analytes were evaluated using the screening criteria. Thus, the Phase I Report should also include (1) a summary of the comparison of detection limits to risk-based screening concentrations, and (2) a discussion and interpretation of the screening results. It is not adequate to only indicate that detected concentrations were screened using screening criteria without providing additional discussion on detection limits and the non-detected contaminants.*

Constituents that were not detected in any sample collected during the RFI for a particular medium were not evaluated by comparing detection limits to screening criteria. This is consistent with USEPA (1989) risk assessment guidance, which recommends that such constituents be excluded from risk assessment. Table SC8a (attached) shows the constituents that were not detected in any sample of a particular medium.

Among the constituents detected in at least one sample of a medium, ESOI has identified those with unusually high sample quantitation limits and compared these limits with the screening criteria. In these comparisons, unusually high sample quantitation limits were considered to be those that are higher than the QAPP-specified EQLs by 10-fold or more. Table SC8b (attached) shows the results for groundwater and soil. No constituent in surface water or sediment had unusually high sample quantitation limits.

The results in the attached table show that the only constituent in groundwater that had an unusually high sample quantitation limit was 2,4,5-TP and the sample quantitation limit does not exceed any screening criteria. For soil, a few constituents (PCBs, antimony, cadmium, and thallium) had unusually high sample quantitation limits and the limits exceed screening criteria.

However, these occurrences are limited to the periphery of SWMU 6 (North Sanitary Landfill) in samples collected during 1995 and 1996 (as part of the prior RFI). As such, these occurrences do not affect the scope of field work for the next phase of RFI field work, since USEPA has previously agreed that soil characterization of the NSL periphery during the prior RFI is adequate.

9. *The soil screening procedures outlined in the Phase I Report differ from those in the approved Phase I Work Plan. Specifically, the Phase I Work Plan outlines a screening procedure that evaluates sampling data using the risk-based screening criteria based on a target cancer risk of 10^{-6} . However, page 24 of the Phase I Report identifies a second level segregation screening procedure, which evaluates sampling data using risk-based screening criteria based on a target cancer risk of 10^{-5} . EPA's acceptable risk range is 10^{-4} to 10^{-6} ; however, the impact of screening potential contaminants based on a 10^{-5} rather than a 10^{-6} target cancer risk may result in cumulative impacts in the upper end of the risk range. For example, if more than ten contaminants exceed the risk-based screening criteria based on 10^{-5} , cumulative risks may fall into and far exceed a cumulative risk of 10^{-4} . Thus, screening using a cumulative target risk of 10^{-5} is not sufficiently conservative.*

Additionally, the Region 5 RCRA program considers the Region 5 states' requirements and strives to achieve consistency with the Region 5 states target risk limits for remedial decisions. Specifically, Ohio EPA has indicated in its Closure Plan Review Guidance for RCRA Facilities: Part II: Guidance for Reviewing Risk-Based Closure Plans for RCRA Units (March 1999) that cumulative cancer risk may not exceed 10^{-5} . Consequently, the risk screening for no further action at a cumulative risk level of 10^{-4} is not sufficiently conservative and should be reduced to a target cancer risk level of 10^{-5} . The Phase I Report should be revised to address these concerns.

ESOI agrees that the situation described in this comment is a valid concern, and had directly evaluated its potential to occur for the SWMUs and AOCs where the RFI soil data were compared to screening criteria based on a cancer risk of 10^{-5} . ESOI's evaluation showed that screening with criteria based on a cancer risk of 10^{-5} was adequately conservative. Specifically, ESOI calculated estimates of cumulative cancer risk using the maximum detected constituent concentrations at each SWMU and AOC to identify any case in which the cumulative risk estimate exceeds 10^{-4} and no concentrations exceed the screening criteria.

Table SC9 (attached) summarizes the cumulative risk and HI estimates for each SWMU/AOC and the number of constituents with concentrations that are higher than the screening criteria based on a cancer risk of 10^{-5} and hazard quotient (HQ) of 1. As shown on Table SC9, the SWMUs with cumulative cancer risk estimates higher than 10^{-4} also have constituent concentrations that exceed the screening criteria. SWMUs and AOCs that do not have any concentration higher than the screening criteria also have cumulative risk estimates that are less than 10^{-4} (actually no higher than 4×10^{-6}) and HI estimates that are less than 1.

The attached results confirm that ESOI's use of screening criteria based on 10^{-5} cancer risk was adequately conservative. ESOI also notes that the use of this approach was consistent with the RFI Work Plan and Ohio EPA's acknowledgment of its intended purpose as stated in its Work

Plan NOD Specific Comment 37, which said,

The U.S. EPA Region IX PRGs are not calculated at a target cancer risk of $1E-5$ [as proposed by ESOI], but are calculated at a target cancer risk of $1E-6$. Ohio EPA understands that these PRG values are to be utilized as a delineation tool and not as a screening tool for the purpose of elimination of COCs from the risk assessment process. With that intended purpose, ESOI may use the numbers they have proposed.

Finally, ESOI has previously noted that the Ohio EPA's CPRG provides guidance for RCRA closures but does not provide guidance on RCRA corrective action. ESOI is unaware of any Ohio regulations that specifically address how remedial decisions are to be made on the basis of cumulative cancer risk levels under the state's RCRA corrective action program. However, Section 3734.12 of the Ohio Revised Code suggests that Ohio rules for RCRA corrective action should be consistent with and equivalent to those under the federal RCRA corrective action program:

The director of environmental protection shall adopt and may amend, suspend, and rescind rules in accordance with Chapter 119. of the Revised Code, which shall be consistent with and equivalent to the regulations adopted under the "Resource Conservation and Recovery Act of 1976," 90 Stat. 2806, 42 U.S.C.A. 6921, as amended, except for rules adopted under divisions (D) and (F) of this section governing solid waste facilities and except as otherwise provided in this chapter, doing all of the following:...

For remedial decisions under Ohio's RCRA corrective action program to be consistent with and equivalent to those under the federal program, the cumulative cancer risk trigger for corrective measures in the Ohio program should be the same as that under the federal program. Specifically, OSWER Directive 9355.0-30 explains that USEPA uses the cumulative excess cancer risk range of 10^{-6} to 10^{-4} for determining site-specific cleanup levels, once a need for remediation has been identified. However, it also explains that USEPA generally uses a cumulative site-related cancer risk level of 10^{-4} for identifying when remediation is warranted in the first place.

10. *It does not appear that the inhalation of volatiles emanating from groundwater or soil into indoor air was considered in the screening process. Vapor intrusion has been identified in the CSM as a potential exposure pathway, but none of the risk-based screening criteria used to evaluate concentrations of detected contaminants include this as a potential exposure pathway. Although this pathway was not addressed in the Phase I Work Plan, it should be discussed in detail in the Phase I Report and incorporated into the Phase II Work Plan. At a minimum, concentrations in groundwater and indoor air should be evaluated for the potential to migrate via vapor intrusion. Using the November 2002 Draft Guidance entitled Evaluating the Vapor Intrusion into Indoor Air (EPA 2002), ESOI should perform the Tier 1 and Tier 2 screening recommended in the guidance to assess whether additional data gathering is necessary to determine if this exposure pathway is complete.*

Vapor intrusion is a potential exposure pathway at only SWMU 8 (Building C), where indoor air

samples will be collected during the next phase of RFI field investigations. Vapor intrusion is not a current or reasonably expected future exposure pathway elsewhere at the Facility because buildings are not allowed to be constructed in these areas which are occupied by permitted or historical land disposal units.

4.2.2.3 Quantitative Comparison to Ecological-Based Screening Levels

11. *Page 28 lists the “screening criteria” used to evaluate media concentrations. Page 28 notes that surface water results will be compared to ecological screening levels (EDQLs) “for aquatic life.” In contrast, the EDQLs referenced in the Phase I Report do not specify aquatic life, but rather are listed by media (e.g., surface water). The Phase I Work Plan (p. 4-3) specifies that surface water EDQLs will be used, not aquatic life EDQLs. It is unclear if the correct EDQLs have been used in the Phase I Report because EDQLs based on wildlife risks may be substantially lower than those determined only for the protection of aquatic life (see August 22, 2003 update of EPA’s 1999 guidance, Ecological Screening Levels for RCRA Appendix IX Hazardous Constituents). Of additional note, the soil and sediment screening values are ecotoxicity benchmarks or screening values and should not be referred to as “criteria” in this section or elsewhere in the Phase I Report.*

The Phase I Report will be revised to clarify that the media-specific Region V EDQLs were used for this initial data screening. In addition, the Phase I Report will be revised to refer to the additional soil and sediment screening values as benchmarks rather than criteria.

4.4 Preliminary Cumulative Risk for Human Health

12. *The Phase I RFI Work Plan indicates that exposure concentrations estimated from the analytical data will be used to estimate site-related cancer and noncancer risks in the human health baseline risk assessment (HHRA). Section 4.4 of the Phase I Report only includes estimates of cumulative cancer risk (CR) and noncancer HI for potential exposures to industrial workers, but does not include a comprehensive HHRA which evaluates risks to potential receptors under current and potential future land use conditions. It is not clear whether a comprehensive baseline HHRA will be performed once investigations are complete and will be included as part of the Phase II RFI Report. The Phase I Report should include a discussion of the intent of providing preliminary cumulative risk estimates and should qualify that these results are preliminary and precede a full baseline risk assessment.*

As indicated in response to General Comment 18, Section 4.1 RFI Work Plan specifies that data collection will be conducted in phases. After each phase, adequacy of the data to meet these RFI objectives will be evaluated to determine whether additional data collection is warranted. When data of sufficient quality and quantity have been collected, the data will be used to complete a baseline human health risk assessment and an ecological risk assessment.

13. *Page 103 presents upper bound estimates of cumulative CR and noncancer HI for potential exposures to industrial workers. The text indicates that the maximum detected concentrations were used in conjunction with EPA Region 9 preliminary remediation goal (PRG) default values to derive estimates of risk. The text also states that these are upper bound estimates because maximum concentrations were used and that actual estimates would be lower if site-specific exposure factors were applied. The Phase I Report does not include site-specific exposure factors, nor does it discuss the differences between the Region 9 PRG default values and proposed site specific parameters. Thus, the statement that this is an upper bound estimate is unsupported and misleading. The Phase I Report should be revised to include either site-specific exposure parameters and cumulative risk calculations under a reasonable maximum exposure (RME) scenario as described in the Phase I Work Plan or include a discussion regarding the difference between site-specific parameters and Region 9 PRGs and how the Region 9 PRGs provide conservative upper bound estimates of risk at the site.*

The default exposure factors which are used in deriving the risk-based Region 9 PRGs are considered by USEPA to be protective of high-end exposures to soil by industrial workers (USEPA. 1991. *Human health evaluation manual, supplemental guidance: "Standard default exposure factors."* Memorandum from T. Fields, Jr., Office of Emergency Remedial Response, to B. Diamond, Office of Waste Programs Enforcement. OSWER Directive 9285.6-03), including the assumption that a worker is in daily contact with soil for a full 8 hours. Actual site-specific exposures would be lower than these high-end values since workers at ESOI generally do not spend an 8-hour day at a SWMU in contact with outdoor soil. This difference alone would ensure that site-specific criteria would be less stringent than the PRGs, even if USEPA's conservative, standard default exposure factors were used for all other exposure factors in the calculations.

14. *It is not clear whether the cumulative risk estimates were derived using the maximum concentration of all detected contaminants, or only those detected contaminants with concentrations exceeding screening criteria. As discussed in Specific Comment 8, the Phase I Report does not indicate whether the detection limits for those non-detected contaminants were evaluated using the screening criteria or whether non-detects were completely eliminated from further evaluation. This could significantly impact cumulative CR and HI risk estimates and should be discussed in the Phase I Report. The Phase I Report should be revised to address this issue.*

The preliminary cumulative risk estimates are based on the maximum detected concentration for all constituents detected at an area. As stated in the RFI Report, the purpose of this initial risk evaluation is to identify constituents likely to contribute significantly to the risk estimates. The influence of nondetects on risk estimates will be addressed in the baseline risk assessment. Also, see response to Specific Comment 8.

15. *The Phase I Report does not present estimates of risk for exposure to other media, including groundwater, surface water, and sediment. If the intent of the Phase I Report is to determine whether sampling is adequate and assess or present information on the human*

health risks, a detailed discussion of the results from sampling each medium should be included in the report. The Phase I Report should be revised to address this issue.

The purpose of the cumulative risk estimates for soil was to confirm that the use of soil screening criteria based on a cancer risk of 10^{-5} was sufficiently conservative, as discussed in the RFI Report and in response to Specific Comment 9. Cumulative risk estimates were also calculated for sediments for the same reason (as shown on Table 4.7a of the RFI Report), because soil screening criteria based on a cancer risk of 10^{-5} were conservatively used to evaluate the sediment data. Cumulative risk estimates were not calculated for groundwater and surface water because the data for these media were evaluated using MCLs, which are regulatory standards that do not have specific risk levels associated with them. As such, it is not appropriate to calculate cumulative risk estimates for them.

4.5.1.4 Important Ecological Resources

16. *Pages 107 to 108 state that there is an absence of important ecological resources at multiple areas of the site. However, the rationale, process, and specific data used to determine such an absence is not provided in the Phase I Report. Appendix E.1 of the Phase I Work Plan states that an absence of habitat would be verified in the Phase I investigation. There is no information on how this verification was performed, nor is there a reference to where the area-specific verification results are presented. The Phase I Report should be revised to include the rationale and specific ecological information used to determine that an area did not have "ecological relevance." For example, it is not clear how it was determined that bald eagles would not feed on prey exposed to contaminants in the excluded areas (p. 7 of Appendix E states that the site is within the range of bald eagles).*

A more complete documentation of site conditions, potential impact to wetlands from site activities, and the rationale for not identifying certain areas of ESOI as valued ecological resources will be included in the ERA. A screening level ERA will be conducted after the completion of supplemental field sampling activities designed to fill data gaps and reduce uncertainties in the risk assessment. Comments pertaining to the appropriate approach to evaluation of habitat in different areas of ESOI will be considered after the completion of Phase II sampling activities and the implementation of ERA activities.

4.5.2.1 Ecotoxicological Benchmark Values

17. *Pages 108 to 110 describe the ecological screening values used in assessing concentrations of chemicals in RFI samples. The initial screening results were presented in Tables 4.9 to 4.15 using screening values that considered the potential for wildlife risks for most detected chemicals. Appendix I of the Phase I Report then presented a re-screening of COPCs identified in the initial screening to, "assess the potential ecological significance of the concentrations." The re-screening was not performed appropriately because none of the selected additional screening values appear to consider wildlife risks; i.e., all of the selected benchmarks are only based on direct toxicity to aquatic organisms, plants, and soil invertebrates. It is unclear how "ecological significance" can be evaluated when wildlife*

risks are not considered in the selected benchmarks. It is also unclear what decision criteria were used in deciding if a benchmark exceedance was “ecologically significant.” The Phase I Report should be revised to address these concerns.

We disagree with the agency that the screening benchmarks used do not reflect wildlife risks. As part of the chemical screening process agreed to by the agency, chemicals in surface water, soil and sediment were compared to USEPA, USFWS, ORNL, and CCME benchmark values. The methods used to derive the ecological screening values are based on toxicity testing to various wildlife species and include such endpoints as LC50s, NOELs and LOELs.

18. *The ecological screening tables in both the main text (Tables 4.9 to 4.15) and Appendix I assess detected analytes. The Phase I Report should also include (1) a summary of the comparison of detection limits to EDQLs or other benchmarks that consider toxicity to both community receptors and to wildlife, and (2) a discussion and interpretation of the screening results. It is not adequate to only refer the reader to multiple complex tables without discussing the rationale for considering a compound a COPEC and for determining the need for additional investigation. Both the Phase I Work Plan and Report state that professional judgement was a major component in the decision process. This professional judgement should be made clear in the Phase I Report. The Phase I Report should also briefly summarize the rationale for the selection of analytes in each SWMU, AOC, or IA or cite the specific section of the Phase I Work Plan where this information is provided. The Phase I Report should be revised accordingly.*

Further clarification describing the rationale for considering a compound a COPEC and for determining the need for additional investigation based on the screening results will be summarized in the revised report.

4.5.2.2 Potential Exposure Pathways and Ecological Receptors

19. *Pages 110 to 111 make broad generalizations regarding the quality of ecological habitat that do not appear consistent with the results of the Appendix E Ecological Report. The Ecological Report indicates that a diversity of species may utilize site habitat and species with life stage characteristics that may provide high exposures are present (e.g., shrews, robins, amphibians, sandpipers, herons). Specific concerns include:*
 - *The Phase I Report’s conclusion (p. 111), states that the only potentially complete exposure pathway for soil and sediment is prey ingestion, is not adequately supported. Community receptors (e.g., benthic and soil invertebrates, aquatic and terrestrial plants) are likely to be exposed to surficial soil and sediment. Wildlife may also be exposed to soil and sediment through incidental ingestion during foraging and preening (Beyer et al., 1994).*
 - *The Phase I Report’s statement (p. 111) that there are no aquatic ecological receptors in the retention basins or drainage ditches is not consistent with the Appendix E Ecological Report. Page 13 of the Ecological Report cites an Ohio EPA report that the*

Driftmeyer Ditch contained fish. It is highly likely that any ditches with standing or flowing water contain benthic and water column invertebrates, which are aquatic community receptors.

The Phase I Report should ensure consistency and accuracy throughout the report. Inaccurate statements regarding the presence or absence of ecological receptors should be removed. If a determination of an absence of potential ecological exposures is made based on the relatively narrow habitat definitions presented in the Phase I Work Plan (pp. 3-48 and 3-49) then this should be clearly stated. As noted above, the criteria, procedures, and information used to verify an absence of habitat must be presented for each specific area. This has not been adequately presented in the Phase I Report. The Phase I Report should be revised to address these concerns.

While the *Survey of Existing Terrestrial and Aquatic Habitats Associated with the RCRA Facility Investigation* (MSG, 2003) indicates that it is possible that species could utilize the site, the results from The Mannik and Smith Group (MSG) survey found no evidence of birds and mammals foraging or nesting at the site. A more complete documentation of site conditions, potential impact to wetlands from site activities, and the rationale for not identifying certain areas of ESOI as valued ecological resources will be included in the ERA.

An evaluation of complete and incomplete exposure pathways was not conducted as part of the scoping assessment. The ecological evaluation focused on determining valued ecological resources and the need for more data in areas where ecological receptors were reasonably expected to potentially be exposed to site-related chemicals. The MSG Report suggests that there is no evidence of wildlife being exposed to the soil and sediment through incidental ingestion due to their observations that no birds or mammals were found foraging in these areas.

4.5.3 Chemicals of Potential Ecological Concern

20. *Pages 111 to 113 summarize the identification of COPCs, and refer the reader to Appendix H. Appendix H of the Phase I Report is an evaluation of background soil data. Appendix I presents ecological screening results using multiple benchmarks, and does not clearly identify the COPCs. The Phase I Report should be revised to clarify and provide the rationale for COPC selection.*

The report will be revised to identify Appendix I and provide rationale for COPEC selection as noted.

21. *The process used to identify ecological COPCs in the Phase I RFI Report is not consistent with current EPA guidance (EPA, 1997, 1998, 2001). Of additional concern, the Phase I RFI Report does not present a screening ERA, which is not consistent with the Phase I Work Plan. Instead, the Phase I Report presents a screening of site samples through a comparison to a variety of ecotoxicity benchmarks and to site-specific background levels. Background screening is not allowed in a screening ERA according to the 1997 EPA Guidance and 2001 EPA Guidance, and the presentation of ratios of sample concentrations*

to benchmarks does not constitute an ERA. Specific aspects of the screening ERA that are missing from the Phase I Report include problem formulation, analysis of exposure and effects, risk characterization, and uncertainty analysis. It is unclear if an ERA will be performed after the Phase II sampling is completed, but additional investigation may be needed beyond the currently proposed work if ecological risks are present. The current process of identifying COPCs is not adequate and the identification of ecological COPCs should be repeated using a screening process that is in accordance with current EPA guidance and that addresses the issue identified in this technical review. The Phase I Report should be revised to address these concerns.

As stated previously, it was not the intent to perform a detailed ERA as part of Phase I investigation activities. Prior to conducting this detailed risk assessment, data gaps were identified based on the scoping-level ecological evaluation. The ERA will address the concerns expressed in this comment. See also response to General Comment18.

4.5.4 Sampling Recommendations for Ecological Evaluation

22. *Pages 113 to 115 briefly summarize the conclusions regarding additional sampling needed on site and at Otter Creek. These conclusions are not adequately supported because the Phase I Report has not adequately documented the absence of on-site habitats, and the COPC identification was not performed in accordance with the 1997 EPA Guidance and 2001 EPA Guidance. The Phase I Report should be revised to address these concerns.*

The COPC identification process follows the general approach presented in the USEPA 1997 and USEPA 2001 document, though it does so in a concurrent rather than sequential manner. For example, maximum concentrations were compared to EDQLs. Only then were additional ecological screening values considered, which is consistent with the USEPA approach for an iterative evaluation of chemicals that should be retained for further investigation (use of other relevant criteria is also consistent with the approved RFI Work Plan). This step of evaluation was conducted to identify data gaps. The sequential manner of COPC selection will be performed as part of the ERA.

23. *Section 2.1.1.3, Page 9, Paragraph 2. The text states that there is no demonstrated direct connection between shallow ground water and the adjacent Gradel Ditch north of the facility.*

Figure 2-1 displays the bottom elevation of Gradel Ditch to be 583.44 ft. above mean sea level (amsl). The fluid level elevation in lacustrine/upper till wells F-2S, SW-1S, and SW-2S are at times above the bottom elevation of Gradel Ditch (i.e. April 2002 F-2S = 585.44 ft. amsl; SW-1S = 586.23 ft. amsl; SW-2S = 585.85 ft. amsl, ESOI October 2002). This indicates that at times the shallow ground water and lacustrine/upper till ground water are discharging to Gradel Ditch. During dry periods fluid levels may be too low or the rate of discharge may not exceed the rate of evaporation and vegetative uptake and the hydraulic head pressure may not exceed the capillary absorption capability of the soil. Shallow ground waters usually have some flow component towards ground surfaces or surface water

bodies with lower elevations.

Contaminants found in shallow ground water must be shown to be of concentrations less than surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) before they reach their point of discharge to the ground surface or surface water body. In addition to wells next to Gradel Ditch, all water table wells, lacustrine/upper till wells and waterline trenches that are pumped and discharged to the ground surface need to be evaluated comparing analysis results to risk-based surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002). Some of the potential shallow ground water discharge points include the following:

- i. Ditch along the north side of Millard Avenue Landfill (SWMU 5);*
- ii. Ditch along the east side of SWMU 5;*
- iii. Ditch along the south side of SWMU 5;*
- iv. Ditch along west side of Cell F (SWMU 1);*
- v. Low area east of the North Sanitary Landfill (SWMU 6);*
- vi. Storm water ponds at Cell H (SWMU 3) and Cell I (SWMU 4);*
- vii. The storm sewer that discharges to Otter Creek and runs along the south side of the Old Oil Pond (SWMU 8) and Butz Crock (AOC 7); and*
- viii. Waterline trenches (AOC 1) that are pumped and discharged to the ground surface.*

Phase I analysis results for water table wells and lacustrine/upper till wells and monitoring/dewatering trenches that are pumped and discharged to the ground surface shall be re-evaluated comparing the results to risk-based limits for discharges to surface water (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2003). The RFI Phase I Report shall also be revised to include a table of discharge to surface water screening criteria for all Phase I constituents.

In addition to the above referenced text section, Section 4.3.3.3, Page 49 shall be revised to identify Gradel Ditch as a point of ground water discharge to surface water.

All of the water table interface samples adjacent to surface water bodies were screened against the appropriate surface water criteria as discussed in the approved RFI Work Plan. Additional screening of lacustrine/shallow till wells near surface water was not part of the approved RFI Work Plan, nor was any evidence of discharge from this zone to surface water identified during Phase I of the RFI activities. In fact, groundwater being monitored in the lacustrine/upper till wells is under confined conditions rather than unconfined (or water table) conditions such that the measured groundwater elevations are potentiometric heads rather than water table elevations. This indicates there is no direct contact between groundwater in this contact zone and the water in surface ditches, and that any vertical flow due to the piezometric head would be restricted by the overlying low conductivity soils. With respect to SWMU 5, water table elevations obtained from the temporary water table wells along the north side of SWMU 5 do not suggest that there is any connection between groundwater and the adjacent ditch.

Well ID	GW elevation (June 2002)	Approximate Adjacent Ditch Bottom Elevation*
T-22W	573.15	576
T-23W	573.15	580
T-24W	575.40	581

* Based Upon November 2002 Aerial Topographic Survey

ESOI notes that there is no ditch present on the east side of SWMU 5. The ditches on the north and south side of SWMU 5 serve as drainage ditches between the road and SWMU 5. Water has only been noted in these ditches following rainfall events.

The only water from the Waterline trenches that is discharged to the ground surface is the water pumped from Trenches I, II, and VI, and only purge water from “non-affected” wells is discharged to the ground surface. Once a well is “confirmed” to contain non-naturally occurring constituents, all purge water is containerized and handled with the facility’s leachate. In addition, once discharged to the ground, this water drains to surface water retention ponds at the ESOI facility, which are regularly monitored for compliance with NPDES permit requirements. Therefore, the effect of water discharges from Trenches I, II, and VI or any monitoring well on surface water, if any, is monitored on a regular basis as part of ESOI’s NPDES permit compliance monitoring, and additional evaluation is unnecessary. Further, direct sampling of water from the Trench I, II, and VI monitoring trenches as part of the Phase I RFI did not identify any constituents that warrant further investigation.

With respect to Gradel Ditch, the water level elevations measured by the lacustrine/upper till wells are potentiometric elevations and not water table elevations, and indicate that water in this contact zone is under confining pressure. Therefore, the discussion in this comment regarding comparison of Gradel Ditch elevations and elevations measured by upper till wells is incorrect and such a comparison does not show that ground water from this saturated zone is hydraulically connected to surface water. As part of its review of the facility’s on-going ground water monitoring program, Ohio EPA has previously recognized the fact that water bearing zones above the uppermost aquifer at the ESOI site are not hydraulically interconnected.

24. *Section 2.1.2, Page 10, Paragraph 1. ESOI indicates that all samples collected for the purpose of determining if a release occurred were analyzed for "all VOCs, SVOCs, PCBs, herbicides, pesticides, and inorganics listed..." It appears samples collected in the stained soil area west of the Millard Avenue Landfill (SWMU 5) were not analyzed for all these parameters. Given the staining in the area, apparently emanating from the landfill, and that this area is potentially hydraulically connected with Otter Creek, it is imperative that this potential release be fully characterized. Regardless of whether similar contaminants are found upstream, any contribution from ESOI should be fully characterized and abated, if necessary. ESOI remains responsible for any ongoing and historic contamination from its site.*

Soil and ground water samples from the stained soil area on the west side of SWMU 5 were analyzed for all Phase I Parameters. The data from these analyses were included in the Phase I

Report. However, as discussed in Section 4.3.2.5 of the Phase I Report, the SVOCs data for ground water from sample location T-20S were rejected during data validation. The Phase II Work Plan proposed installation of a permanent monitoring well at this location to allow groundwater sampling and analysis for the entire Phase I Parameter list. The Phase II Work Plan also proposed installation of additional temporary wells north and south of T-20S to further investigate the NAPL observed in T-20S, as well as a delineation well to be installed west of Otter Creek. In addition, the Phase II Work Plan includes collection of two sediment samples in Otter Creek in the vicinity of T-20S, approximately 15 feet upstream and downstream of the Site 3 Phase I sediment sample location.

In response to concerns identified in this comment and subsequent discussion with USEPA, ESOI proposes to supplement this scope of work with the addition of temporary well points to be installed between T-20S and Otter Creek to delineate the extent of free product west of T-20S. Because of physical constraints, these temporary wells will likely be installed by hand methods. In addition, two more sediment samples will be collected from Otter Creek, one adjacent to the T-20S location and one approximately 15 feet upstream of this location.

25. *Section 2.1.2, Page 10, Paragraph 1. ESOI indicates that all samples collected for the purpose of determining if a release occurred were analyzed for "all VOCs, SVOCs, PCBs, herbicides, pesticides, and inorganics listed..." There are several additional sampling parameters identified on Table 3-2 of the RFI Work Plan, some of which have not been identified in the RFI Phase I Report data summary tables (i.e., Inorganic, geochemical parameters and soil property parameters). ESOI shall revise the RFI Phase I Report to clearly identify which locations were selected to have additional sampling parameters analyzed for and the significance of those results to the Phase II Work Plan.*

Section 3.4 of the RFI Work Plan and Table 1-3 of Appendix A in the RFI Work Plan identify the sample parameters for each area and media to be sampled.

26. *Section 2.1.2.1, Page 11, Bullet 2. The text states total thallium results at wells H-3D, H-3S, I-5SA and total antimony results at wells I-3D, I-5SA, I-7S, H-3S exceeded the maximum contaminant level (MCL). The text states that any further work regarding thallium and antimony, if necessary, will be addressed under ESOI's routine ground water monitoring program.*

The baseline risk assessment must include all elevated constituents in the evaluation. The RFI Phase I Report does not define background for inorganics nor has the routine ground water monitoring program completed this determination. The RFI Phase I Report must be revised to define background and identify all elevated constituents. The Phase II Work Plan must be revised to include the determination of the full extent of all elevated constituent plumes.

Since these exceedances are associated with Cell H and Cell I, no further investigation was proposed as part of the RFI activities. Rather, it was recommended that further assessment of these wells be conducted as part of ESOI's routine groundwater monitoring program.

Consistent with the work proposed in the Phase II Work Plan, the Work Plan will be revised to include resampling of these wells for thallium and/or antimony to confirm the results from the Phase I RFI.

27. *Section 2.1.2.2, Page 12, Bullet 2. Section 2.1.2.2, Page 12, Bullet 2. The text states that three background wells were installed and sampled (BG-1S, BG-1D, and BR-1R) and existing wells M-13S, M-13D, M-2S, MD-2D and R-11 were sampled for background water quality.*

The Phase I Work Plan does not state that existing wells M-13S, M-13D, M-2S, MD-2D and R-11 will be used to collect background data. Furthermore the Phase I Report does not include an evaluation of the data from these wells as to whether the data is representative of background. In addition, fluid level measurements taken during the April 2003 sampling event at background bedrock well (BGR-1) indicates that the selected background wells may not be upgradient. The fluid level data indicates that there may be a well to the southeast withdrawing water creating a cone of depression southeast of the facility. This makes the discussion or justification that the data is representative of background conditions even more of a necessity.

The Phase II investigation shall include an investigation to determine whether there are ground water production wells located southeast of the facility, a determination of ground water flow direction, and include an evaluation of background data as to whether it is representative of background.

Section 3.4.14.2 of the Phase I Work Plan states that existing wells M-13S, M-13D, M-2S, M-2D, and R-11 will be sampled for background water quality during the RFI. However, a background evaluation for ground water has not yet been completed. Regardless of the background evaluation, there were no concentrations in the bedrock wells above the MCLs or DWELs. Therefore the issue of a potential pumping well southeast of background well BGR-1 is irrelevant.

Further, a monitoring well does not necessarily have to be "upgradient" to be representative of background conditions. It should be within the same hydrogeologic strata and unaffected from site operations or other potential contaminant sources, as is BG-1R.

28. *Section 3.2.2, Page 15, Paragraph 1. ESOI states that "Accuracy is the degree of agreement between an observed value and an accepted reference value. Field accuracy was assessed through the regular calibration of field instruments and through the collection of field and trip blanks." It is not clear how this assessment was done as the report only indicates that instruments were calibrated and field and trip blanks were collected, not how they were assessed and against what criteria. ESOI shall revise the Phase I report to clearly describe how field accuracy was assessed based on calibration of instruments and the results of field and trip blanks.*

In addition, ESOI states that "Laboratory accuracy was assessed through the analysis of matrix spike and method spike samples." ESOI shall revise the Phase I Report to define method spike samples. When problems are found with Matrix Spike samples (and duplicates), usually Laboratory Control Samples are evaluated in conjunction to see if the target compounds can be recovered under "ideal" conditions with a clean matrix. Was this done here? ESOI shall revise the Phase I Report to include the results of such overall QA/QC analyses.

Section 3.2.2.1 of the Phase I report states that field instruments were calibrated daily and that the results were recorded in the field notes. Further each instrument met the manufacturer's requirements for proper calibration. If an instrument was found to be out of calibration, corrective measures were undertaken. Assuming a field instrument is properly calibrated, maintained and operating within normal specifications, the readings from such instruments are, by their very nature, considered accurate.

The results of the field and trip blanks were discussed in the individual Data Validation Memoranda issued with the Monthly Progress Reports and provide as Appendix F of the RFI Phase I report. Any impact that the field or trip blanks had on the data is addressed in these memoranda and the data qualified accordingly.

Method spike/LCS is defined within Section 3.2.3 of the approved QAPP. Method spikes were run with all sample analyses. The effect that method spike results had on the data qualification, if any, was addressed in the Data Validation Memoranda, and the data qualified accordingly.

29. *Section 3.2.2.2, Page 16. ESOI indicates that laboratory accuracy will be assessed using MS/MSD samples. Section 3.2.2.2 goes on to say, "...the criteria for acceptance of these results were listed in Table 3.1 of the QAPP." Table 3.1 does not list such criteria but further down in the text it says, "Values for % R are expected to be within three standard deviations of the average. These ranges are updated on an annual basis. Values outside this range indicate procedural problems that may adversely affect the accuracy of the determination. A recovery of 80 -120% will be used as a guidance for low volume analyses that do not create sufficient data points (20 or more per year)."*

It is not clear what this means and how it demonstrates meeting the criteria. How is three standard deviations applied or applicable to varied environmental samples - from different hazardous waste units spread across a large site. Or if the +20% criterion for low volume analyses is used, what is the outcome if results are outside those limits? Are these limits also met for soils and sediment samples? Present data to verify these criteria were met (e.g., summary tables of QA/QC results with analysis of how criteria were attained). Provide a source for this approach.

The reference to Table 3.1 is incorrect. Tables 3-2a through 3-2g of the QAPP contain the quality control acceptance criteria for all quality control results, including MS/MSD. The Phase I report will be revised to reference the appropriate tables.

ESOI does not understand the remainder of the comments in the first paragraph above. Neither

Table 3.1 of the QAPP nor Section 3.2.2.2 of the Phase I RFI report contain the statement "Values for % R...(20 or more per year)."

The remainder of this comment is related to standard practices used to establish quality control limits for analytical methods. As part of the data quality review the sample data were compared to the limits presented in Tables 3-2a through 3-2g of the QAPP, presented as Appendix A of the approved RFI work plan. Deviations from these limits were noted in the individual Data Quality Memoranda issued for each Sample Delivery Group, as provided within Appendix F of the Phase I RFI Report. The source for the approach is the data validation process prescribed within the QAPP and other referenced USEPA guidance documents.

30. *Section 3.2.4, Page 17, Paragraph 1. It is not clear where the 90% completeness goal was derived from or how it was implemented. Explain exactly what this goal means and how it was measured. Upon completion of all sample assessment (including Data Validation) the Data Quality Objective of completeness should be evaluated by unit - not overall for the site. The sample assessment should include the number of samples associated with a SWMU or AOC that are affected by qualification, the degree of qualification (i.e., "J" or "R"), etc. It should also evaluate if any of the not complete data is critical (e.g., for determining extent, documenting concentrations of important/risk-driving compounds, etc.) and whether it should be replaced.*

While the Phase I RFI work plan is obviously organized by SWMU, AOC and/or Investigation Area, the approved QAPP specifies that data assessment be completed by the total number of samples collected, not by individual SWMU or AOC.

The completeness goals for field and laboratory data are listed in Sections 3.3.2 and 3.3.3, respectively, of the QAPP provided as Appendix A of the approved RFI Work Plan. As defined within Section 3.3.1, completeness is the number of valid measurements obtained compared to the number of measurements planned. Section 12.3 of the approved QAPP provides the formula for calculating completeness. The table in Section 3.2.4 of the Phase I report contains the input data and results for this equation.

Notwithstanding this assessment of completeness, as discussed in the Phase I RFI Report/Phase II Work Plan, ESOI has identified sampling locations where data collection was incomplete, and proposed additional sampling to fill data gaps.

31. *Section 3.2.4, Page 18, Table. It is not clear if the samples identified in Appendix A, Table 1-3 of the RFI Work Plan were completed. Revise the table on Page 18 to be similar in appearance to Table 1-3 in Appendix A of the RFI Work Plan so that a direct comparison can be made.*

The table in Section 3.2.4 was designed to provide a summary of the data inputs related to completeness. While as indicated in the response to Specific Comment 30, above, the approved QAPP does not specify data assessment by individual SWMU or AOC, but by total number of samples collected, a column will be added to the table to indicate the individual unit or units with

which each sample is associated.

32. *Section 3.2.4, Page 18, Paragraph 1. ESOI indicates that 66% of the acetonitrile data is complete because acetonitrile was a recurring contaminant in blanks (Sample Delivery Groups 11, 15, 18, etc.). Has this compound been detected in previous sampling events at ESOI? It was detected in RFI sediment samples above ecological screening levels. It also appears to have been detected in soil samples including S-F20C7P1-091602-NAB-187 (SDG 19). Any detections of this possible contaminant should be discussed in terms of a comparison to the concentration in the associated blank sample. Often a '10X rule' is used. For example, a detection is considered to be valid if it exceeds 10 times the level of contaminant in the blank. Also, the data validation summary for SDG 15 (dated February 28, 2003) refers to Section IX, Item 8 in the Case Narrative for further explanation. This item does not appear to be in the RFI report. ESOI shall revise the Phase I Report to include the Case Narrative that is referenced and a discussion of the detection of possible contaminants in terms of a comparison to the concentration in the associated blank.*

The '10x Rule' was used during data validation to assess potential effects from constituents reported in blank samples. The effect, if any, of acetonitrile on any of the sample results was discussed in the individual Data Validation Memoranda issued with each Sample Delivery Group (copies of which are provided as Appendix F of the Phase I RFI report) and the associated data were flagged accordingly. Additionally, the Case Narratives accompanying the individual sample delivery groups contained discussions related to acetonitrile, the Case Narratives were included with the validation memos. Information obtained from the Case Narratives was used in conjunction with data review to qualify the data. A copy of the Case Narrative for SDG-15 will be provided with the revised Phase I RFI report.

33. *Section 4.2, Page 20, Paragraph 1. This section indicates that a streamlined approach for review of the data will involve segregating data that indicates "a higher potential for human health or ecological significance...from those that indicate a low potential." This section further indicates that, "decisions regarding the need for further investigation will be made based on professional judgement considering the screening results and results of the qualitative review." The rationale for this approach is not well defined. Results of such a review must be completely transparent to explain to the public why exceedances of "appropriate, conservative human health and ecological risk-based screening levels" using "current and reasonably expected future land uses" do not require some action. The segregated data should be clearly linked with the explanations regarding why exceedances of screening data do not require additional sampling or remediation in the associated unit.*

See response to Specific Comment 9. The screening approach is consistent with the recent discussion between ENVIRON and USEPA on other corrective action programs (i.e., one risk level for setting a "COC" list and another for highlighting potentially significant concentrations). This approach is based on prior successful experiences on a large number of RFI projects conducted under USEPA Region 5 review.

34. *Section 4.2.1, Page 21, Bullet 1. The report indicates that ESOI will assess if Non-Aqueous Phase Liquids (NAPLs) are likely to be present but does not specify how ESOI is assessing "unusually high constituent concentrations, which may indicate the presence of nonaqueous-phase liquids." In ground water, levels that are below the water solubility maximum can indicate the possible presence of NAPL. Or for soils, values below the calculated soil saturation limit (U.S. EPA 1996b) can indicate the possible presence of NAPL. Various Rules of Thumb have been established for what level should be used to conservatively assess the possible presence of NAPL (which would typically require additional sampling to verify its presence or absence). For example ITRC (1999) and U.S. EPA (1992) have used detection of potential NAPLs in ground water at greater than 1% of their maximum solubility as an indicator that NAPL may be present. ESOI shall revise the Phase I Report to provide a rationale and reference(s) for the method(s) used to evaluate the possible presence of NAPL at this site, an evaluation of any places NAPL may be present, and an explanation of how they will be further evaluated (e.g., additional sampling).*

In accordance with the approved RFI Work Plan (Appendix B, Field Sampling Plan), the presence of NAPL was assessed with an interface meter (MSG SOP No. 1904) and/or by a dye test (MSG SOP No. 2322). As reported in the Phase I RFI Report, NAPL was detected at two locations at ESOI's facility and a review of the Phase I RFI data does not suggest the presence of any other location(s) on the ESOI site where "unusually high constituent concentrations" were reported. Specifically, NAPL was encountered within shallow temporary monitoring well T-20S on the west side of SWMU 5 and at shallow temporary monitoring well T-33S near the northeast corner of SWMU 8. Additional investigation has been proposed at both of these locations during Phase II of the RFI.

35. *Section 4.2.2.2, Page 24, Bullet 1. ESOI derived "soil leaching to potable ground water" criteria "using the procedure outlined in USEPA's Soil Screening Guidance (USEPA 1996b) and the USEPA's default dilution attenuation factor (DAF) of 20, and as such, the calculations are not repeated here." ESOI's derived criteria should be reproducible. Therefore, provide the input values (in table format) used to derive the soil leaching to potable ground water criteria. Also, a review of the leaching to ground water comparison standards raises the following concerns.*
- i. The conditions at ESOI's Otter Creek facility do not meet the default criteria described in U.S. EPA's soil screening guidance (i.e., the guidance assumes a 0.5 acre source area) (EPA540/R-96/018, July 1996c).*
 - ii. ESOI does not substantiate its statement on page 24 that "site-specific input parameters would result in higher DAF values." Provide an explanation for using a 20 DAF or revise the calculations using a 1 DAF.*
 - iii. It is assumed that ESOI used Equation 10: Soil Screening Level Partitioning Equation for Migration to Ground Water (EPA540/R-96/018, July 1996c). This calculation assumes that no NAPLs are present and if NAPLs are present, the SSLs do not apply. ESOI may not use SSLs where NAPLs were identified in the Phase I*

investigation.

- iv. *A comparison of U.S. EPA's generic SSLs for migration to ground water using 20 DAF (EPA/540/R95/128, July 1996b) to ESOI's derived standards reveals that ESOI's derived standards are, in some cases, orders of magnitude less conservative. For example, ESOI's standard for benzene is 2.0 mg/kg. U.S. EPA recommends a standard of 0.03 mg/kg for benzene. ESOI's standard for 1,1-dichloroethane is 1,500 mg/kg. U.S. EPA recommends a standard of 23 mg/kg for 1,1-dichloroethane.*

Therefore, develop a site specific leaching to ground water screening criteria, using the generic SSLs (migration to ground water, 1 DAF) from Table A-1 (EPA/540/R95/128, July 1996b), or provide a justification for using the generic SSLs calculated using 20 DAF. Developing a site specific comparison standard includes developing a site-specific DAF and collecting site-specific soil parameters (such as the dry bulk density and percent soil moisture). After choosing an option, revise the RFI Phase I Report and Recommendations for Phase II Investigation to reflect the new standards and any additional findings based on the new leaching to ground water comparison standards.

Calculation of the soil leaching criteria is shown on Table SC35a (attached). These calculations are based on the two approaches discussed in the USEPA Soil Screening Guidance: equilibrium-partitioning and leach test. The SSG allows soil leaching potential to be evaluated using either approach. The equilibrium-partitioning calculations used in the RFI Report followed the equation in the SSG, and the input parameters and calculations are shown in the attached table. This approach assumes that an infinite mass of contaminant is present and is realistic for constituents that tend to adsorb strongly to soil, and is unrealistic for constituents that leach readily.

EPA also allows the use of leach tests, because they directly correct for the infinite mass assumption in the equilibrium-partitioning calculations and are more realistic for constituents that do not adsorb strongly to soil. In the RFI Report, a worst-case leach test approach was used to derive leaching criteria by conservatively assuming that the entire mass of a constituent in a soil sample will leach into the extraction fluid during the Synthetic Precipitation Leaching Procedure (SPLP). The leaching criterion for a particular constituent that was used for evaluating soil data is the higher of the criteria based on equilibrium-partitioning and worst-case leach test.

Both sets of criteria were calculated using the USEPA-recommended default DAF of 20, which is conservative for source areas up to 0.5 acre according to USEPA. In the RFI Report, the leaching criteria were applied to individual samples, rather than whole SWMUs or AOCs, so that the 0.5-acre limit did not need to be applied to whole SWMUs or AOCs. The DAF of 20 was also believed to be conservative for the ESOI facility because conservative site-specific calculation of a DAF following the SSG guidance would give higher DAFs.

Attached are two example DAF calculations (see Table SC35b) that demonstrate this. The first is a site-specific DAF calculated using conservative site-specific assumptions for groundwater velocity in the upper-most aquifer under the ESOI facility (approximately 4 m/yr), theoretical

infiltration rate through the till overlying the aquifer (approximately 10^{-3} m/yr), thickness of the aquifer (10 m), and a source length of 45 m (equivalent to 0.5 acre). The calculated DAF is approximately 400. This means that if an individual soil sample represented a 0.5 acre area, ESOI could have used a DAF of 400 instead of 20. A review of the sample location maps included in the RFI Report shows that some of the soil samples represented no more than a 0.5 acre.

The second calculation solves for the largest source length that would give a DAF of 20 while keeping the other assumptions the same as in the first example calculation. The calculated source length is approximately 2,000 m. This means that ESOI's use of a DAF of 20 was conservative if the distance between individual samples or a SWMU/AOC boundary was less than approximately 1,000 m (2,000 m divided by 2), equivalent to 247 acres. A review of the sample location maps included in the RFI Report shows that no soil samples are separated from other samples in the same SWMU/AOC or the SWMU/AOC boundary by more than this distance. Therefore, the DAF of 20 was conservative.

ESOI did not apply these soil leaching criteria to locations where NAPL was identified. As indicated in the Phase II RFI Work Plan, additional investigation is proposed at locations where NAPL was identified.

36. *Section 4.2.2.2, Page 24, Paragraph 1. Successive levels of data screening was not approved in the RFI Work Plan (ESOI 2002) and may not be used. Revise the RFI Phase I Report to reflect the approved soil screening methodology.*

See response to Specific Comment 9.

37. *Section 4.2.2.2, Page 24, Paragraph 2. U.S. EPA approved Region 9 Industrial Preliminary Remediation Goals (PRG) (USEPA 2002) for soil screening. Region 9 PRGs are chemical concentrations that correspond to a fixed level of risk. The fixed level of risk for cancer is $10E-6$. This screening target cancer risk is also supported by U.S. EPA in the May 1996 Federal Register (61 FR 19432, May 1, 1996a). Using $10E-5$ as a screening level is not acceptable, particularly with multiple chemicals present. Revise the Phase I RFI Report and Phase II Work Plan to reflect the use of PRGs calculated with a target cancer risk level of $10E-6$.*

Additionally, using an Hazard Quotient (HQ) of 1 is not appropriate. Using an HQ of 1 does not account for the presence of multiple chemicals. To address this, the October 2002 PRG guidance states that "if the risk-based PRG is set at a $HQ = 1$, and the user would like to set the HQ to 0.1 to take into account multiple chemicals, then this is as simple as multiplying the risk-based PRG by 1/10th." Screening is a conservative step and screening levels must reflect that approach. Revise the Phase I RFI Report and Phase II Work Plan to reflect the use of an HQ of 0.1.

See response to Specific Comment 9.

38. *Section 4.2.2.2, Page 25, Paragraph 2, and Supplemental RFI Pages regarding EDWLs (DeLussa 2003). When assessing worker exposure by unit, risk assessment procedures must sum risks from different units when the task is similar and it can reasonably be assumed the same worker might be doing work at multiple units (e.g., maintenance). If a maintenance/construction worker scenario is used to calculate risk levels for screening chemicals, a multiple unit/day exposure may also be appropriate (depending on if the chemical is present in samples from multiple units). Compounds should not be screened out based on exposure assessment for one unit when these compounds are also present elsewhere on the site.*

As stated in the RFI Work Plan and repeated in response to Specific Comment 9, the screening evaluation has not been performed to screen out chemicals from consideration in the baseline risk assessment. However, our screening criteria assume that workers spend the entire 8-hour work day at a single unit. Summing the risk estimates derived from these criteria for multiple units would grossly “double-count” exposure. If exposures from multiple units are summed, then the risk for each unit would first have to be reduced so that the sum of the exposure time does not exceed 8 hours per day. This prorating approach can never give results that are higher than assuming a full-day exposure at each unit. The issue of summing risks across units will be addressed in the baseline risk assessment.

39. *Section 4.2.2.2, Page 26, Bullet 1 and Supplemental RFI Pages regarding EDWLs (DeLussa 2003). ESOI states that “For chemicals without MCLs, the risk-based EDWLs are calculated using EPA standard default exposure factors for residential drinking water consumption (i.e., 2 L/day, 350 days/year, 30 years, and 70 kg body weight; US EPA 1991a), US EPA-derived oral reference doses (RfDs) and cancer slope factors (SFs), and a target cancer risk of 10^{-5} and a target HQ of 1. A summary of the drinking water screening values is provided on Table 1”*

The RFI Phase I Report does not contain Table 1 and it does not describe how the EDWLs were calculated.

For chemicals without MCLs ESOI shall use the following equations (Ohio EPA 1999) to derive Equivalent Drinking Water Levels (EDWL). For the noncancer intake equation ESOI shall calculate both adult and child exposures and use the most conservative value, of the two, for the EDWL.

Noncancer: Intake (mg/kg-d) =

Cancer: Intake (mg/kg-d) =

<i>Exposure Parameters</i>		<i>Units</i>	<i>Value</i>
<i>CW</i>	<i>Concentration in Water</i>	<i>mg/l</i>	<i>Exposure Point Concentration</i>
<i>IR</i>	<i>Ingestion Rate</i>	<i>l/day</i>	<i>1 (child)</i> <i>2 (adult)</i>
<i>EF</i>	<i>Exposure Frequency</i>	<i>days/yr</i>	<i>350</i>
<i>ED</i>	<i>Exposure Duration</i>	<i>yrs</i>	<i>6 (child)</i> <i>30 (adult)</i>
<i>BW</i>	<i>Body Weight</i>	<i>kg</i>	<i>15 (child)</i> <i>70 (adult)</i>
<i>AT</i>	<i>Averaging Time</i>	<i>days</i>	<i>2,190 (child - noncancer)</i> <i>10,950 (adult - noncancer)</i> <i>25,550 (cancer)</i>

In addition, ESOI's EDWLs must be reproducible. To facilitate the review of ESOI's EDWLs, revise the RFI Phase I Report to include a table of the US EPA-derived oral reference doses (RfDs) and cancer slope factors (SFs) used to derive the EDWLs. The RfDs and SFs shall be the most current available US EPA-derived oral toxicity factors as stated on Page 4-3 of the RFI Work Plan.

Finally, since the EDWLs are being used for screening criteria, to account for additive risk, ESOI must calculate the EDWLs using a target cancer risk of 10E-6 [excess lifetime cancer risk = chronic daily intake (CDI) x slope factor (SF)] and a target hazard quotient (HQ) of 0.1 [HQ = CDI/reference dose (RfD)]. Conservative screening is necessary to assure the full extent of areas exceeding the baseline risk assessment goal of 10E-5 have been defined.

Revise the following additional text sections, tables, and figures accordingly:

- i. Section 4.3.1.4, Page 33, Bullets 3, & 4;*
- ii. Section 4.3.1.4, Page 34, Bullet 1;*
- iii. Section 4.3.2.4, Page 41, Bullet 4;*
- iv. Section 4.3.2.4, Page 42, Bullet 2;*
- v. Section 4.3.2.3, Page 43, Bullet 2;*
- vi. Section 4.3.3.4, Page 52, Bullet 1;*
- vii. Section 4.3.3.4, Page 53, Bullet 2;*
- viii. Section 4.3.4.4, Page 60, Bullet 2;*
- ix. Section 4.3.5.4, Page 68, Bullet 2;*
- x. Section 4.3.5.4, Page 69, Bullet 1;*
- xi. Section 4.3.7.4, Page 72;*
- xii. Section 4.3.11.4, Page 84, Bullet 3;*
- xiii. Section 4.3.11.4, Page 84, Bullet 4;*
- xiv. Section 4.3.12.4, Page 95, Bullet 2;*
- xv. Section 4.3.12.4, Page 95, Bullet 4;*
- xvi. Table 1, which is not listed in the Table of Contents and is not in the Report but is referenced in the text, Section 4.2.2.2, Page 26, Bullet 1 (Table 1 shall*

- be included in the report);*
 xvii. *Tables 4.4a; 4.4b; and*
 xviii. *Figures 4.1-1; 4.1-2; 4.2-1; 4.2-2; 4.3-1; 4.3-2; 4.4-1; 4.4-2; 4.5-1; 4.5-2; 4.6-1; and 4.6-2.*

ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of “child” exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill “MCL gaps”, and the use of such exposure factors would be inconsistent with the USEPA’s procedure for deriving national drinking water standards for noncarcinogens. Table SC 39 presents the EDWLs calculations, including the toxicity values which were used. Recalculation of the EDWLs is not necessary.

40. *Section 4.2.2.2, Page 26, Bullet 2. The risk-based screening criteria for shallow nonpotable ground water does not include risk-based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion).*

The RCRA Facility Investigation Work Plan, Volume 2, Appendix E, Page 1 includes this exposure pathway. The RFI Phase I Report shall be revised to include screening criteria for exposure to vapor intrusion into buildings. Sampling locations where Phase I analysis results exceed either the risk-based dermal exposure criteria or the vapor intrusion exposure criteria shall be maintained for further investigation to determine the extent of exposure for both pathways.

The following additional text sections, tables, and figures will need to be revised accordingly:

- (i) Section 4.3.1.4, Page 33, Bullet 3;*
- (ii) Section 4.3.1.4, Page 33, Bullet 5;*
- (iii) Section 4.3.2.4, Page 42, Bullet 1;*
- (iv) Section 4.3.2.4, Page 43, Bullet 1;*
- (v) Section 4.3.3.4, Page 53, Bullet 1;*
- (vi) Section 4.3.4.4, Page 60, Bullet 1;*
- (vii) Section 4.3.4.4, Page 61, Bullet 1;*
- (viii) Section 4.3.5.4, Page 68, Bullet 3;*
- (ix) Section 4.3.7.4, Page 72;*
- (x) Section 4.3.11.4, Page 86, Bullet 1;*
- (xi) Section 4.3.12.4, Page 95, Bullet 3;*
- (xii) Table 4.4b; and*
- (xiii) Figures 4.1-1; 4.1-2; 4.2-1; 4.2-2; 4.3-1; 4.3-2; 4.4-1; 4.4-2; 4.5-1; 4.5-2; 4.6-1; and 4.6-2.*

See response to Specific Comment 10.

41. *Section 4.2.2.2, Page 26. The Ground water evaluation discussed on this page leaves out the screening criteria for shallow nonpotable ground water near a surface water body.*

In accordance with the Phase I Work Plan, Section 4.2, Page 4-3, bullet 4, shallow nonpotable ground water near a surface water body and any identified ground water discharges or seeps to surface water or wetlands are to be evaluated using Ohio Water Quality Criteria applicable to the designated classification of the surface water body (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002).

The RFI Phase I Report shall be revised to maintain all areas for further investigation that exceed the screening criteria for discharges to surface waters. This means that all areas where shallow ground water discharge to surface water at concentrations exceeding surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) must be maintained for further investigation even if they do not exceed the dermal exposure and vapor intrusion exposure risk based criteria.

The discussion regarding screening of contaminant concentrations in shallow ground water near a surface water body is included in Section 4.2.2.3 (page 28) of the Phase I Report. This screening was completed as described in the RFI Work Plan and the results are shown on Tables 4-10 and 4-14 of the Phase I Report.

42. *Section 4.2.2.2, Page 27, Paragraph 1. The text states "Chemicals with at least one concentration that exceeds drinking water criteria at any AOI [Area of Interest] are selected for display on data-box figures to show their spatial distribution across the facility."*

Constituents were screened out that were at the drinking water criteria and/or were historically above the drinking water criteria. Constituents that were not above drinking water criteria during the April 2002 sampling event but have been above the criteria in the past should not be screened out. Historical results above the criteria are an indication that a plume above the criteria may be present further downgradient. The extent of the historical levels has not previously been determined and should therefore be conducted during Phase II. The extent of these plumes were not included in Phase I because ESOI stated that they first wanted to determine the width of the plumes and the extent would be determined during Phase II. Constituents that have been historically above drinking water criteria since January 2000, are listed in the table below.

The RFI Phase I Report and Phase II Work Plan shall be revised to identify historical ground water analysis results that exceed drinking water criteria. Phase II shall include additional wells to investigate the vertical and horizontal extent of the plumes identified by the historical ground water analysis data.

The wells listed below are screened in the till contact zones. As documented in other ESOI submittals, the ground water flow rates are conservatively estimated to be 0.1 – 6 ft/year in the lacustrine/upper till contact zone, and 0.01 – 0.5 ft/year in the upper till/lower till contact zone. This indicates that in the time between January 2000 and April 2002, ground water moved between approximately 0.02 ft and 12 ft. Since sampling in April 2002 did not detect concentrations at these locations, these data would suggest that there is not a significant "plume"

of contamination that has move further downgradient. In fact, the process of sampling in these limited yielding till zones likely resulted in extracting water from the downgradient “plume” area. The Phase II Work Plan includes sampling of monitoring wells F-2S for VOCs and SW-2S for metals, as discussed in Sections 4.3.1.5 and 4.3.3.5.

Historic Concentrations of Constituents in ESOI Monitoring Wells Above Drinking Water Criteria										
Well ID	Parameter	MCL / PRG* µg/l	Sampling Event and Concentration in µg/l							
			Jan. 2000	July 2000	Oct. 2000	Apr. 2001	Oct. 2001	Apr. 2002	Oct. 2002	Apr. 2003
F-2S	Chloroethane	4.6		11.9	8.1	6.2	8.6			8.38
	1,1-Dichloroethane	8.1		21.7 & 17.4	16.5	15.7	16.8	13.2	8.8	
	1,2-Dichloroethane	5.0		8.2	5.1	5.0	6.1	5.0	5.3	
	Tetrahydrofuran	1.6		2.6			5.5	2.9	9.9	
MR-2D	Benzene	5.0	6.4		5.9					
	1,4-Dioxane	61.0*		185	240	178	159	180	194	141
	Tetrahydrofuran	1.6	11.3	4.7	7.4	4.8	3.1	9.3	7.2	11.8
MR-3D	1,4-Dioxane	61.0*	70.2		98	70.6		72.6		61.3
MR-2S	1,4-Dioxane	61.0*	186	150	405	188	246	184	210	159
	Tetrahydrofuran	1.6	2.4 & 4.3		5.3	2.2	3.5	5.1	2.1	
SW-3D	Tetrahydrofuran	1.6	1.6							
SW-1S	1,4-Dioxane	61.0*	764	1,830	1,760	1,475	1,010	1,260	1,390	1,080
SW-2S	1,4-Dioxane	61.0*	537	918	849		810	798	629	882
H-1S	Tetrahydrofuran	1.6	2.9 & 10.6	151	32.5					
Note: 1) Only results above MCL/PRGs are listed. 2)*PRG = Region IX PRG for tap water except for the value for 1,4-Dioxane. The value for 1,4-Dioxane is ESOI's calculated EDWL, which must be recalculated as described in a previous comment.										

43. *Section 4.2.2.2, Page 27, Paragraph 2. The text states that in the second step of screening shallow ground water, data are compared to criteria for dermal exposure to constituents during excavations. This step screens out shallow ground water data that does not exceed the dermal contact risk-based number.*

The second step should only screen shallow ground water data further if it does not exceed any of the following three risk-based exposure criteria:

- 1. Surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) for shallow ground water discharging to surface waters;*
- 2. Vapor intrusion criteria; or*
- 3. Dermal exposure to workers during excavations.*

In addition, it should be made clear that the only screening criteria that is applied to deep till well data is the MCL/EDWL criteria.

The text referenced above shall be revised to maintain areas for further investigation if any of the above risk-based screening criteria for shallow ground water are exceeded. The text shall also be revised to maintain areas for further investigation where deep till well data exceed MCLs or EDWLs. The text and figures for each SWMU and AOC or AOI data evaluation must be revised accordingly.

See response to Specific Comments 10 and 40 (vapor intrusion). Also, lacustrine/upper till zone ground water are not screened against the surface water criteria as there is no indication of a hydraulic connection between this zone and adjacent surface water. Only the ground water interface locations immediately adjacent to surface water have this criteria applied (Specific Comment 23).

The report will be revised to clarify that only the MCL/EDWL screening criteria are applied to deep till well data.

44. *Section 4.2.2.2, Page 27, Paragraph 4. The text states that if turbidity results from monitoring wells exceed 5 nephelometric turbidity units (NTU) then dissolved metals analysis will be used for assessing the significance of metals concentrations.*

The use of 5 NTU criteria to determine whether to use filtered data is acceptable except when a formation is characterized by a high degree of particle mobility or when conducting a risk assessment and exposure to the filtered particles would be likely (Ohio EPA February 1995, Pages 10-20 and 10-21). In the case of dermal exposure to metals in an excavation non-filtered data should be used in the risk evaluation. Another point of clarification is that the 5 NTU criterion is used as a limit that below which there should be no filtering and if above filtering may be justified. It must first be shown that the well has been properly developed with stable turbidity measurements, low flow sampling procedures must have been employed, and the particle size to be filtered must not be likely to be mobile in the formation being monitored (5 micron filter size is recommended).

Totals analysis results shall be used when evaluating dermal exposure to metals. The following additional text sections will need to be revised accordingly:

- i. Section 4.3.1.4, Page 33, Bullet 4, Paragraph 2;*
- ii. Section 4.3.2.4, Page 42, Bullet 2, Paragraph 2;*
- iii. Section 4.3.2.4, Page 43, Bullet 2, Paragraph 2;*
- iv. Section 4.3.2.5, Page 45, Bullet 2, Paragraph 2;*
- v. Section 4.3.3.4, Page 53, Paragraph 1;*
- vi. Section 4.3.3.4, Page 53, Bullet 2, Paragraph 2;*
- vii. Section 4.3.3.4, Page 54, Paragraph 1;*
- viii. Section 4.3.4.4, Page 61, Paragraph 1;*
- ix. Section 4.3.4.4, Page 62, Paragraph 1;*
- x. Section 4.3.5.4, Page 68, Bullet 2, Paragraph 2;*
- xi. Section 4.3.5.4, Page 69, Bullet 1, Paragraph 2;*
- xii. Section 4.3.11.4, Page 84, Bullet 3, Paragraph 2;*
- xiii. Section 4.3.11.4, Page 86, Paragraph 1;*
- xiv. Section 4.3.11.4, Page 87, Paragraph 2;*
- xv. Section 4.3.11.5, Page 88, Bullet 2;*
- xvi. Section 4.3.11.5, Page 89, Paragraph 1;*
- xvii. Section 4.3.12.4, Page 96, Paragraph 1.*

The use of a 5 nephelometric turbidity units (NTU) criteria in the use of dissolved metals analysis for assessing the significance of metals concentrations is consistent with Ohio EPA guidance provided for other sites where it is difficult to gather nonturbid ground water samples. This approach is particularly relevant for this RFI where a significant portion of the groundwater data were collected from low-yielding temporary well points that were not subject to the same level of development as permanent wells. The calculation of dermal dose from exposure to chemicals in groundwater must be based on aqueous-phase concentration data (i.e., without any solid-phase contributions) because the permeability coefficients (Kp) used in the calculations are valid only for dissolved-phase chemicals (see USEPA guidance 1992, and draft RAGS Part E).

- 45. Section 4.2.2.2, Page 27, Paragraph 5. ESOI states that “surface water characterization data are quantitatively compared to the risk-based screening criteria described above...” The criteria referenced is MCLs/EDWLs. The RFI Work Plan states that “surface water results will be evaluated using applicable standards based on the Ohio Water Quality Criteria applicable to the designated classification of the surface water body (OAC 3745-1), USEPA ambient water quality criteria (USEPA 1999b) and USEPA Region 5 ecological screening criteria (USEPA 1998c) for surface water.” ESOI shall revise this paragraph to reference the surface water screening criteria approved in the RFI Work Plan.*

Section 4.2.2.2 discusses screening against the human health-based screening levels. A discussion of the comparison against the ecological screening values, including the Ohio Water Quality Criteria, is provided in Section 4.2.2.3 of the Phase I Report.

46. *Section 4.2.2.4, Page 29, Bullet 1. As discussed in the General Comments, the cap depths (from Table 4.1) in some areas (e.g., SWMU 6) appear to be inadequate. Cap depths of less than 36 inches subject ecological receptors (e.g., burrowing animals, earthworms that serve as a food source for higher trophic levels, etc.) to potential exposure to waste materials (this may be exacerbated by cracking of clay soils resulting from freeze/thaw cycles). Cap depths should be measured more accurately than the nearest foot to assure that ecological receptors have a minimum chance for exposure and to protect from freeze/thaw damage to ensure the integrity of the cap. If cap depths are not increased to 36 inches, it is necessary that these areas are delineated and all contaminants present within the top 36 inches are properly characterized with adequate samples to determine maximum concentrations in these area(s).*

Refer to the response to General Comment 14 regarding the agreed upon minimum cover thickness warranting further evaluation.

In addition, the current requirement for solid waste landfills in counties adjacent to Lake Erie to have 36 inches of cover soil is exclusively provided for freeze-thaw protection and has no relevance whatsoever with regard to direct contact standards. In fact, Ohio's solid waste regulations do not provide a prescriptive remedy for any vector control other than daily cover requirements. Furthermore, Ohio EPA's Voluntary Action Program [OAC 3745-300-07(G)(1)(a)(i)(b)] does provide for a two-foot point of compliance for direct contact on properties where a use restriction or other institutional control is in place. ESOI's property is deed restricted to prevent unrestricted use. Additionally, the cover soils are all clean clay and no waste disposal activities have occurred on these portions of the site since the SWMUs were closed, and ESOI has standard operating procedures (i.e., additional institutional controls) to control burrowing animals and other potential vectors, as they may occur.

47. *Section 4.3.1.5, Page 34, Paragraph 3, Bullet 1 and Page 35, Bullets 1, 2, and 3. SWMU 1 Recommendations for Phase II Investigation shall also include the following:*
- i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.*
 - ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to surface water risk values.*
 - iii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.*
 - iv. The re-evaluation of deep till wells shall use MCLs and EDWLs for the screening criteria.*
 - v. Resampling existing wells to confirm laboratory analytical results was not*

included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- vi. Resampling of all bias low data (data qualified UJ) at temporary well locations.*
- vii. Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes.*
- viii. Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.*

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- ix. Install permanent ground water monitoring wells (lacustrine/upper till, upper till/lower till, bedrock) near temporary well location T-36.*
- x. Evaluation of occasional historical detections of volatile organic compounds (VOCs) in bedrock monitoring well R-9 (i.e. October 2000, toluene 1.3 µg/l and xylene 2.1 µg/l ESOI February 2001) may be conducted dependent upon the findings of the additional investigation conducted at well location R-4.*

- (i) ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of “child” exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill “MCL gaps”, and the use of such exposure factors would be inconsistent with the USEPA’s procedure for deriving national drinking water standards for noncarcinogens. Recalculation of the EDWLs is not necessary.
- (ii) In accordance with the approved RFI Work Plan, data from water table interface samples were compared to the surface water screening criteria specified in the RFI Work Plan (see Table 4-10 and 4-14 of the Phase I Report). Groundwater data from the lacustrine/upper till monitoring wells were not compared to surface water screening criteria because groundwater from this saturated zone is not believed to be hydraulically connected to surface water. It should be noted that water level elevations measured by the lacustrine/upper till wells are potentiometric elevations and not water table elevations, and indicate that water in this contact zone is under confining pressure. Therefore, the discussion in Specific Comment 23 regarding comparison of Gradel Ditch elevations and elevations measured by upper till wells is incorrect and such a comparison does not show that ground water from this saturated zone is hydraulically connected to surface water. However, additional water level data will be collected during Phase II of the RFI (see response to Specific Comment 48), and the need for additional data screening will be reevaluated based on these data.
- (iii) Existing restrictions on future site use preclude the construction of buildings on SWMU 1. Therefore, it is unnecessary to compare water table interface and lacustrine/upper till data to vapor intrusion criteria. Furthermore, all ground water data have already been compared to MCLs/EDWLs to identify areas for further investigation. According to USEPA, if groundwater concentrations are below MCLs, then quantitative evaluation of the vapor intrusion pathway is not necessary. Therefore, ESOI has already implemented a more stringent screening of shallow (nonpotable) groundwater by using MCLs/EDWLs.
- (iv) As reported in the Phase I RFI Report, groundwater data from the upper till/lower till contact zone wells were compared with MCLs/EDWLs. As indicated in response to subpart (i) above, rescreening of these data is not warranted.
- (v) The purpose of resampling ground water at certain wells is to confirm concentrations measured in Phase I. The objective of the RFI field investigation, as discussed in the RFI Work Plan, is to collect sufficient data to characterize the nature and extent of any release from the ESOI facility. The risk assessment will use data that best represents groundwater conditions at the site, consistent with USEPA guidance on risk assessment. As such, the data used in the risk assessment generally will not consist of only the highest concentrations found at a site.
- (vi) Data that are qualified “UJ” are not “biased low” as suggested in this comment. The “UJ” qualifier means that the data validation procedure determined that the data are reliable enough to confirm that the analytes were not detected, but the limits of detection were less precise than normal. Resampling only because the data are qualified as “UJ” is not consistent with the RFI Work Plan QAPP or standard USEPA QA/QC protocols.

- (vii) The wells at SWMU 1 which the agency has identified in Specific Comment 42 as historically having constituent concentrations above screening criteria were sampled during Phase I of the RFI. The RFI data have been evaluated to identify the presence of potential “contaminant plumes”, and additional investigation of these areas has been proposed, as appropriate, in the Phase II RFI Work Plan.
- (viii) As discussed above, no additional data screening is necessary. Step out wells at locations where contaminant concentrations exceed the screening criteria have already been proposed in the Phase II Work Plan, as appropriate.
- (ix) No exceedances of the screening criteria were identified in temporary points T-36W or T-36D. As stated in Section 4.3.1.5 of the Phase I Report, sufficient sample volume was not available to collect samples from T-36S for the entire Phase I Parameter List during Phase I of the RFI. However, the Phase II Work Plan includes sample collection from T-36S for the remaining constituents. A permanent shallow monitoring well will be installed at the T-36S location only if sampling of monitoring well T-36S indicates that there is an exceedance of the relevant screening criteria.
- (x) As discussed in Section 1.2 of the RFI Work Plan, the primary objective of the RFI is to gather data to adequately characterize potential human health and environmental risks associated with confirmed releases from the SWMUs/AOCs. None of the reported (but unconfirmed) detections in R-9 exceed the relevant screening criteria and are in fact an order of magnitude below the screening criteria (MCLs of 1,000 ug/L for toluene; and 10,000 ug/L for xylene). Therefore, additional sampling is not warranted.

48. *Section 4.3.2.3, Page 39, Paragraph 1. This section gives information regarding the depth of waste and the depth of leachate (which may vary over time) in this unit and suggests that “a potential for a hydraulic connection between shallow ground water along SWMU 5 and Otter Creek may exist.” This area should be further investigated using samples of migrating water and associated soils and cores of sediments to see if contaminants are migrating or have migrated from this unit into Otter Creek. Contaminants known to be in the creek and/or the unit should all be assessed (i.e., PCBs). A demonstration that some of the water goes under Otter Creek is not equivalent to a demonstration that a release has not occurred. Analyzing soils and sediments may assess past or potential releases, since some contaminants will “stick” to the soil particles (which can slow contaminant migration).*

ESOI will revise the Phase II Work Plan to include additional work to further assess the potential connection between shallow groundwater and Otter Creek. The additional work will include installation of staff gauges in Otter Creek along SWMU 5, and monthly measurements of surface water and ground water levels (from water table, lacustrine/upper till and upper till/lower till wells) during Phase II of the RFI.

In addition, as discussed in response to Specific Comment 24, ESOI has included additional investigation activities in this area of the facility as part of the Phase II RFI.

49. *Section 4.3.2.4, Page 40, Bullet 2. ESOI’s conclusion that no further investigation of*

organic vapor levels is warranted raises concerns. ESOI reported in correspondence to Ohio EPA dated July 2, 2001, July 7, 2001, August 3, 2001, September 13, 2001 and December 5, 2001 that Monitoring Probe 13 (MP13) has had sustained elevated readings. Further evidence of historical sustained elevated readings causing explosive gas concerns along the west side of Millard Avenue Landfill (SWMU 5) is evident by the status of monitoring locations 11, 12A, and 13 being on an increased monitoring schedule as part of the facility's Contingency Plan requirements of the Explosive Gas Monitoring Plan.

ESOI should take this information and the contamination that was identified along the west side of SWMU 5 during Phase I of the RFI into consideration before making a no further action determination. As such, revise the RFI Phase I Report to indicate that further investigation of organic vapor levels will be conducted at MP13.

See response to General Comment 15. The Phase II Work Plan will be revised to include additional data collection from the monitoring probes around SWMU 5. This additional data will be used to evaluate and design, if necessary, corrective measures (e.g., installing passive vents) to address gas generation in SWMU 5.

50. *Section 4.3.2.5, Page 44, Paragraph 2. ESOI shall revise the Recommendations for Phase II Investigation to include a discussion of additional investigations that will be conducted at MP13.*

See response to General Comment 15. The Phase II Work Plan will be revised to include additional data collection from the monitoring probes around SWMU 5. This additional data will be used to evaluate and design, if necessary, corrective measures (e.g., installing passive vents) to address gas generation in SWMU 5.

51. *Section 4.3.2.5, Page 44, Bullets 1 and 2, and Page 45, Bullets 1, 2, and 3. SWMU 5 Recommendations for Phase II Investigation shall also include the following:*

- a. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs;*
- b. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to surface water risk values (all wells along the north, south, east, and west boundaries of SWMU 5);*
- c. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened;*
- d. The re-evaluation for deep till wells shall use the MCLs/EDWLs for screening criteria;*

- e. *Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.*
- f. *Resampling of all bias low data (data qualified UJ) at temporary well locations and resampling of rejected data (data qualified R);*
- g. *Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes;*
- h. *Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.*

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- i. *Ohio EPA field notes recorded oil or brown liquid in wells T-20S, T-21S, and T-23S in the depth range of 10 feet to 14 feet and well T-24D from 60 to 62 feet. Phase II shall include checking these wells for non aqueous phase liquids. These wells shall also be sampled during Phase II for both aqueous and non aqueous phases.*

- j. *Installation of a well at well location T-25D to sample and analyze ground water in the sand noted at a depth of 41 feet to 48 feet below ground surface. A soil sample was taken at this depth during phase I. However, the report does not include any analysis results for VOCs and field notes indicate a FID reading of 578.5 ppm was observed.*
 - k. *Installation and sampling of wells not installed during Phase 1 (T-18D, T-25D, T-26D, and T-27D) if their associated shallow well or adjacent well (F-1DA, G-6, G-8, MR-1SA, MR4S, T-18S, T-25S, T-26S, and T-27SD) exceeds any of the recalculated screening criteria.*
 - l. *Installation of a bedrock monitoring well at the location of well nest MR-3D and S to monitor the vertical extent of contaminants identified in monitoring well MR-3D and to provide adequate monitoring for the westerly flow component in the bedrock aquifer.*
 - m. *Install permanent monitoring well nests (bedrock; upper till/lower till; and lacustrine/upper till) at temporary well locations T-17, T-20, and T-23.*
 - n. *Evaluation of occasional historical detections of volatile organic compounds (VOCs) in bedrock monitoring well R-4 [i.e. April 2002, 1,1,1-trichloroethane 2.8 µg/l; July 2002, xylene 2.7 µg/l and toluene 0.7 µg/l; and January 1999, 1,1,1-trichloroethane 1.6 µg/l (ESOI July 2002, February 2001, and September 1999)]. The evaluation shall include sampling of bedrock well R-4 using diffusion samplers or micro purging and sampling procedures to collect discrete samples from the top foot, middle foot, and bottom foot of the screened interval. Installation of a monitoring well to collect a ground water sample from the lower till / bedrock interface for VOCs analysis. Diffusion sampling and/or micro-purging and sampling procedures shall be submitted to U.S. EPA for approval 30 days prior to conducting the sampling. The presence of contaminants in the bedrock aquifer at any concentration has an impact on the selection of corrective measures for shallow contamination and an impact on the determination of whether the fate and transport calculations from the shallow zones to the bedrock aquifer have been calculated correctly. These additional investigation activities are to determine whether the contaminants are present, but at a concentration below repeatable detection levels and/or if the current bedrock monitoring procedures and screen intervals provide adequate monitoring.*
- (a) ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of “child” exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill “MCL gaps”, and the use of such exposure factors would be inconsistent with the USEPA’s procedure for deriving national drinking water standards for noncarcinogens. Table SC 39 presents the EDWLs calculations, including the toxicity values which were used. Recalculation of the EDWLs is not necessary.

- (b) In accordance with the approved RFI Work Plan, data from water table interface samples were compared to the surface water screening criteria specified in the RFI Work Plan (see Table 4-10 and 4-14 of the Phase I Report). Groundwater data from the lacustrine/upper till monitoring wells were not compared to surface water screening criteria because groundwater from this saturated zone is not believed to be hydraulically connected to surface water. It should be noted that water level elevations measured by the lacustrine/upper till wells are potentiometric elevations and not water table elevations, and indicate that water in this contact zone is under confining pressure. Therefore, the discussion in Specific Comment 23 regarding comparison of Gradel Ditch elevations and elevations measured by upper till wells is incorrect and such a comparison does not show that ground water from this saturated zone is hydraulically connected to surface water. However, additional water level data will be collected during Phase II of the RFI (see response to Specific Comment 48), and the need for additional data screening will be reevaluated based on these data.
- (c) Existing restrictions on future site use preclude the construction of buildings on SWMU 5. Therefore, it is unnecessary to compare water table interface and lacustrine/upper till data to vapor intrusion criteria. Furthermore, all ground water data have already been compared to MCLs/EDWLs to identify areas for further investigation. According to USEPA, if groundwater concentrations are below MCLs, then quantitative evaluation of the vapor intrusion pathway is not necessary. Therefore, ESOI has already implemented a more stringent screening of shallow (nonpotable) groundwater by using MCLs/EDWLs.
- (d) As reported in the Phase I RFI Report, groundwater data from the upper till/lower till contact zone wells were compared with MCLs/EDWLs. As indicated in response to Specific Comment 51(a) above, rescreening of these data is not warranted.
- (e) The purpose of resampling ground water at certain wells is to confirm concentrations measured in Phase I. The objective of the RFI field investigation, as discussed in the RFI Work Plan, is to collect sufficient data to characterize the nature and extent of any release from the ESOI facility. The risk assessment will use data that best represents groundwater conditions at the site, consistent with USEPA guidance on risk assessment. As such, the data used in the risk assessment generally will not consist of only the highest concentrations found at a site.
- (f) Data that are qualified "UJ" are not "biased low" as suggested in this comment. The "UJ" qualifier means that the data validation procedure determined that the data are reliable enough to confirm that the analytes were not detected, but the limits of detection were less precise than normal. Resampling only because the data are qualified as "UJ" is not consistent with the RFI Work Plan QAPP or standard USEPA QA/QC protocols.

- (g) The wells at SWMU 5 which the agency has identified in Specific Comment 42 as historically having constituent concentrations above screening criteria were sampled during Phase I of the RFI. The RFI data have been evaluated to identify the presence of potential “contaminant plumes”, and additional investigation of these areas has been proposed, as appropriate, in the Phase II RFI Work Plan.
- (h) As discussed above, no additional data screening is necessary. Step out wells at locations where contaminant concentrations exceed the screening criteria have already been proposed in the Phase II Work Plan.
- (i) Permanent monitoring wells will be installed and sampled at T-20S and T-23S. The new wells at these locations, in addition to temporary wells T-21S and T-24D will be monitored for the presence of NAPL during Phase II of the RFI. If NAPL is encountered in these wells, ground water and NAPL will be sampled as described in Section 4.3.2.5 - Ground Water, of the Phase I Report/Phase II Work Plan.
- (j) As part of Phase II, a soil sample will be collected from T-25S within this sand zone, at a depth of 42-44 feet for VOC analysis. If this soil boring confirms that this zone is saturated, then a temporary well point will be installed and a ground water sample will be collected and analyzed for the Phase I Parameter list.
- (k) As discussed above, the screening criteria were calculated as indicated in the approved RFI Work Plan, and therefore no additional screening is necessary. Temporary monitoring point T-25D was installed and sampled as part of the Phase I activities. Other deep temporary points at T-18, T-26, and T-27 were not installed due to the presence of overhead power lines in this area. However, none of the concentrations in these shallow wells exceed the relevant screening criteria, so the installation of deep wells at these locations is not necessary.
- (l) Based on the considerable amount of site-specific hydrogeologic data and water quality data gathered by ESOI at this facility, ESOI does not believe that a bedrock well at the MR-3S/MR-3D location is warranted. Specifically, the data indicate that this location is upgradient to slightly oblique-gradient to the facility, and that bedrock wells R-4 and R-14 provide sufficient downgradient coverage to detect potential releases to the bedrock aquifer from SWMU 5. While it is recognized that there is some seasonal variability to the direction of groundwater movement in the bedrock aquifer based on pumping activities at the BP Refinery to the north of ESOI, the predominant direction of groundwater flow in the bedrock aquifer has been and continues to be to the north. By comparison, monitoring wells MR-3S/MR-3D are located on the west side of SWMU 5. According to the groundwater flow data generated as part of ESOI’s routine RCRA groundwater monitoring program, this location is not downgradient of any ESOI solid waste management units.

With regard to the potential for vertical migration of hazardous constituents from the till contact zones to the underlying bedrock aquifer, the hydrogeologic data suggest that

significant migration would be unlikely. In addition to the extremely low hydraulic conductivities within the glacial tills, potentiometric water level data from the twenty-two existing bedrock monitoring wells at the ESOI facility demonstrate a consistent hydraulic head above the top of the bedrock. This upward gradient limits the ability of constituents in the till contact zones to migrate downward and into the underlying bedrock.

In summary, ESOI believes that existing hydrogeologic conditions severely limit the potential for hazardous constituent migration from the till zones into the bedrock. Further, with respect to the MR-3S/MR-3D location, any such migration into the bedrock aquifer would be monitored by the existing downgradient bedrock monitoring wells R-4 and R-14. Monitoring at these two bedrock wells has not identified the need for any further investigation of bedrock ground water quality as part of the RFI.

- (m) The Phase II Work Plan proposed installation of permanent monitoring wells at temporary well locations T-17S/D, T-20S, and T-23S/D. A permanent bedrock monitoring well will be installed only if the exceedance of metals criteria is confirmed upon sampling the permanent monitoring well at the T-17D location. Similarly, a permanent monitoring well will be installed at the T-20D location only if sampling of monitoring well T-20S indicates that there is an exceedance of the relevant screening criteria.
- (n) Discrete sampling from various depths within R-4 is not practical due to the short screen length (i.e., 5-feet) in the well, and the available data do not suggest any reason for changing the approved sampling procedure for this particular well. More importantly, none of the reported (but unconfirmed) detections in R-4 exceed the relevant screening criteria and are in fact an order of magnitude below the screening criteria (MCLs of 200 ug/L for 1,1,1-trichloroethane; 1,000 ug/L for toluene; and 10,000 ug/L for xylene). Therefore, additional sampling is not warranted.

52. *Section 4.3.2.5, Page 45, Dash 3. The text states that permanent shallow and deep till monitoring wells will be installed at the location of temporary wells T-17S/D and T-26S/D. These locations are not the same as noted on the map, Figure 5.1. The map shows permanent wells being installed at well locations T-17S/D, T-20S/D, and T-23S/D.*

The report text needs to be revised to match the Figure 5.1 and the text and Figure 5.1 need to be revised to include bedrock monitoring wells.

The text will be revised to indicate that permanent monitoring wells will be installed at temporary well locations T-17S/D, T-20S, and T-23S/D. The current data do not suggest a need for bedrock monitoring wells at these locations. See also response to Specific Comment 51(m).

53. *Section 4.3.2.5, Page 45, Bullet 2. The text states that if turbidity measurements are greater than 5 neolithic turbidity units (NTU) during sampling then filtered samples will be*

collected for dissolved metals analysis only, otherwise samples for both total and dissolved metals analysis will be collected.

If turbidity measurements are less than 5 NTU, then only totals analysis are needed. If turbidity measurements are greater than 5 NTU, then dissolved analysis results may be acceptable for the ingestion exposure scenario for upper till/lower till wells and bedrock wells. However, total metal analysis results are still necessary for the dermal exposure risk evaluation for water table well data and lacustrine/upper till well data.

See response to Specific Comment 44. The use of a 5 nephelometric turbidity units (NTU) criteria in the use of dissolved metals analysis for assessing the significance of metals concentrations is consistent with Ohio EPA guidance provided for other sites where it is difficult to gather nonturbid ground water samples. This approach is particularly relevant for this RFI where a significant portion of the groundwater data were collected from temporary well points that were not subject to the same level of development as permanent wells. The calculation of dermal dose from exposure to chemicals in groundwater must be based on aqueous-phase concentration data (i.e., without any solid-phase contributions) because the permeability coefficients (Kp) used in the calculations are valid only for dissolved-phase chemicals (see USEPA guidance 1992, and draft RAGS Part E).

54. *Section 4.3.2.5, Page 46, Soils. The boring log for location T-21 indicates that there is "some black staining from 15 feet to 15.5 feet." ESOI shall revise the Recommendations for Phase II Investigation to include sampling of the stained area, analysis for the Phase I Parameter List, and additional investigation of the extent of the noted staining.*

The field notes for this boring indicate that the grey and black silty clay extended from 15 feet to approximately 20 feet in depth. The sampled interval was selected with Ohio EPA oversight from the depth having the "area of most staining". A sample was collected by both ESOI and Ohio EPA from 15.5 – 17.5 feet at this location. Based on the field notes, boring log and analytical results from this sampling location, no additional investigation is warranted.

55. *Section 4.3.3.3, Page 49, Paragraph 1. ESOI states that "there is no separation between SWMU 6, 7, and 9." ESOI shall also state that the boundary of these connected units extends north from the North Sanitary Landfill (SWMU 6) almost to the property line; south from the New Oil Pond (SWMU 9) to the City of Toledo waterline; west of SWMU 6, the Central Sanitary Landfill (SWMU 7), and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 almost to the property line and the western boundary with Cell H (SWMU 3).*

The text will be revised as follows: "...the boundary of these connected units extends north from the Northern Sanitary Landfill (SWMU 6) toward ESOI's north property line; south from the New Oil Pond (SWMU 9) to the northern edge of the City of Toledo's raw waterline easement; west of SWMU 6, the Central Sanitary Landfill (SWMU 7) and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and the sheet piling wall on the east side of Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 toward ESOI's eastern property line and Cell H (SWMU 3)."

56. *Section 4.3.3.4, Page 50, Bullet 2. ESOI states that the screening level was exceeded at PB3 at the time of the RFI monitoring event but that subsequent monthly sustained readings from PB3 did not exceed the screening level. ESOI justifies no further action based on sustained readings taken subsequent to the RFI monitoring event.*

ESOI's justification for no further action is a concern. Resampling events were not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the monitoring results may be unreliable due to suspected or documented problems related to monitoring in the field. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. In addition, PB3 has historically had elevated readings as reported by ESOI in correspondence to Ohio EPA dated September 13, 2001 and August 3, 2001. Further evidence of historical elevated sustained readings causing explosive gas concerns along the north side of the facility is evident by the status of monitoring locations 2, 2A, 3A, 4, 4A, 5 and 5A being on an increased monitoring schedule as part of the facility's Contingency Plan requirements of the Explosive Gas Monitoring Plan.

Further, ESOI states that the "thickness of the existing cap is reasonably expected to mitigate any significant vapor migration." However, explosive gas has already migrated beyond the unit boundary to the PB3 location.

ESOI shall revise the RFI Phase I Report by striking the following sentence: "however subsequent monthly sustained readings from PB3 have not exceeded the screening level." The paragraph shall also be revised to indicate that additional investigation will be necessary.

See response to General Comment 15. Monitoring probes where elevated readings were reported during the Phase I RFI will be monitored for explosive gas on a monthly basis throughout Phase II of the RFI to obtain additional data which will be used to evaluate and design, if necessary, corrective measures (e.g., installing passive vents) to address gas generation and migration from these units. This additional monitoring will be conducted in conjunction with the monthly monitoring which is currently ongoing along the north side of SWMUs 1 and 6 and the west side of SWMU 5 as part of ESOI's approved Explosive Gas Monitoring Plan.

57. *Section 4.3.3.4, Page 51, Bullet 2. ESOI states that the exceedances at sample locations QE-360 and QE-360B have been fully delineated by other samples collected as part of the North Sanitary Landfill (SWMU 6) RFI. Revise the RFI Phase I Report to include the sample locations that reportedly delineate the exceedances and the criteria that was used to determine that an exceedance has been delineated.*

According to the NSL RFI report, the soil sampling intervals were determined in the field based on screening methods (including field GC) and in consultation with USEPA oversight personnel, such that the samples collected for laboratory analysis would represent the highest concentrations anticipated at each soil boring location. Exceedances of the USEPA risk-based residential

Region 9 PRGs were identified at QE-360 at a depth of 0-5.5 feet bgs (this sample location was mislabeled in the RFI report, the sample identification number corresponds to location QE-360BB which is located west QE-360B) and QE-360B at a depth of 0.5 to 1.5 feet bgs. These exceedances are delineated based on a comparison to the same USEPA residential Region 9 PRGs at sample locations QE-360C (7 to 8 feet bgs), QE-340 (6 to 8 feet bgs) and QE-380 (5 to 7 and 7 to 8 feet bgs).

Based on the sampling strategy implemented in the NSL RFI to select sample intervals likely to have the highest concentrations, and the comparison of these sampling results with residential screening criteria which indicate the soil borings exhibiting concentrations above the residential PRGs have been delineated on the east side of SWMU 6, no further sampling is warranted at this location. This conclusion is consistent with prior discussions regarding the investigation of the NSL, since USEPA has previously agreed that soil characterization of the NSL periphery during the prior RFI is adequate.

58. *Section 4.3.3.5, Page 54, Paragraph 1, Landfill Cover. ESOI states that "Based on the evaluation of the Phase I results presented above, no further characterization of the landfill cover is warranted." However, during Phase I of the investigation, ESOI determined that the unit boundaries for the North Sanitary Landfill (SWMU 6) extend beyond the SWMU limits as shown on the RFI Work Plan. The SWMU limits based on Phase I indicate that the unit boundary extends north from the northern edge of SWMU 6 almost to the northern property line, west to the eastern boundary of Cell F (SWMU 1) and east almost to the property line. The southern boundary of SWMUs 6, 7 and 9 is the City of Toledo Waterline. This means that there is waste under the haul roads and other areas (previously identified as outside the unit boundaries) surrounding SWMU 6. Revise the Phase II Investigation to include additional sampling locations to assess the adequacy of the cover of these newly discovered waste disposal areas.*

In addition, in-field permeability testing (ASTM D 6391) more accurately depicts the in-field conditions of the cover soils than thin-walled metal tube recovery of relatively undisturbed soil samples (ASTM D 1587) suitable for laboratory testing (ASTM D 5084). As such, ESOI should consider using the most current version of the Field Measurement of Hydraulic Conductivity Limits (ASTM D 6391) to support the ASTM D 1587/ASTM D5084 data in assessing the permeability of the soils at the designated Phase II sample locations.

Finally, if the objective of the proposed physical properties samples is to demonstrate suitable cover soils in the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9) this will not necessarily mean that corrective measures, such as proper grading and drainage, are not warranted.

Refer to the response to General Comment 14.

Geotechnical analysis was completed in accordance with the methods and procedures specifically described within the approved RFI Work Plan. Similarly, ASTM D 6391 (also known as the Bouwmeester permeameter) is exclusively used to evaluate in-field test pad

construction and ESOI is unaware that it has ever been retroactively applied at a closed landfill facility.

ESOI agrees with the final statement in the comment. The objective of additional geotechnical investigation is not to justify a presumptive remedy but gather sufficient information to facilitate moving to a corrective measures study. Refer to the response to General Comment 9.

59. Section 4.3.3.5, Page 54, Paragraph 1, Landfill Gas. ESOI shall revise the Recommendations for Phase II Investigation to include a discussion of an additional investigation that will be conducted at PB3.

Refer to the response to Specific Comment 56.

60. Section 4.3.3.5, Page 55, Bullets 1 and 2. SWMU 6 Recommendations for Phase II Investigation shall also include the following:

- i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.*
- ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to surface water risk values (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002)(all wells along the northern and eastern boundaries of SWMU 6).*
- iii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.*
- iv. The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.*
- v. Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity*

or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- vi. *Resampling of all bias low data (data qualified UJ) at temporary well locations;*
 - vii. *The baseline risk evaluation requires all organic constituents detected below quantitation limits to be included in the risk evaluation using a value equal to one half of the SQL. To ensure that all organic constituents detected are included in the risk evaluation, Phase II analysis results for those constituents that are detected above the method detection limit, but below the estimated quantitation limit shall be reported with estimated concentrations (“J” qualified). The RFI Phase I Report needs to be revised to provide a list of all organic constituents for each SWMU or AOC that were detected above the method detection limit. The Phase II report shall include a list of all organic constituents for each SWMU or AOC that were detected above the method detection limit during Phase I and/or II;*
 - viii. *Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes;*
 - ix. *Installation of a bedrock monitoring well at the location of well nest SW-3S/D to monitor the vertical extent of contaminants identified in monitoring well SW-3D and to provide adequate monitoring of the easterly flow component in the bedrock aquifer;*
 - x. *Install permanent monitoring well nests (bedrock; upper till/lower till; and lacustrine/upper till) at temporary well locations T-1 and QD-3;*
- (i) ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of “child” exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill “MCL gaps”, and the use of such exposure factors would be inconsistent with the USEPA’s procedure for deriving national drinking water standards for noncarcinogens. Table SC 39 presents the EDWLs calculations, including the toxicity values which were used. Recalculation of the EDWLs is not necessary.
 - (ii) In accordance with the approved RFI Work Plan, data from water table interface samples were compared to the surface water screening criteria specified in the RFI Work Plan (see Table 4-10 and 4-14 of the Phase I Report). Groundwater data from the lacustrine/upper till monitoring wells were not compared to surface water screening criteria because groundwater from this saturated zone is not believed to be hydraulically connected to surface water. It should be noted that water level

- elevations measured by the lacustrine/upper till wells are potentiometric elevations and not water table elevations, and indicate that water in this contact zone is under confining pressure. Therefore, the discussion in Specific Comment 23 regarding comparison of Gradel Ditch elevations and elevations measured by upper till wells is incorrect and such a comparison does not show that ground water from this saturated zone is hydraulically connected to surface water. However, additional water level data will be collected during Phase II of the RFI (see response to Specific Comment 48), and the need for additional data screening will be reevaluated based on these data.
- (iii) Existing restrictions on future site use preclude the construction of buildings on SWMU 5. Therefore, it is unnecessary to compare water table interface and lacustrine/upper till data to vapor intrusion criteria. Furthermore, all ground water data have already been compared to MCLs/EDWLs to identify areas for further investigation. According to USEPA, if groundwater concentrations are below MCLs, then quantitative evaluation of the vapor intrusion pathway is not necessary. Therefore, ESOI has already implemented a more stringent screening of shallow (nonpotable) groundwater by using MCLs/EDWLs.
 - (iv) As reported in the Phase I RFI Report, groundwater data from the upper till/lower till contact zone wells were compared with MCLs/EDWLs. As indicated in subpart(i) above, rescreening of these data is not warranted.
 - (v) The purpose of resampling ground water at certain wells is to confirm concentrations measured in Phase I. The objective of the RFI field investigation, as discussed in the RFI Work Plan, is to collect sufficient data to characterize the nature and extent of any release from the ESOI facility. The risk assessment will use data that best represents groundwater conditions at the site, consistent with USEPA guidance on risk assessment. As such, the data used in the risk assessment generally will not consist of only the highest concentrations found at a site.
 - (vi) Data that are qualified “UJ” are not “biased low” as suggested in this comment. The “UJ” qualifier means that the data validation procedure determined that the data are reliable enough to confirm that the analytes were not detected, but the limits of detection were less precise than normal. Resampling only because the data are qualified as “UJ” is not consistent with the RFI Work Plan QAPP or standard USEPA QA/QC protocols.
 - (vii) All constituents detected above the method detection limit, but below the quantitation limit have been identified with a “J” qualifier (see the Electronic Data Tables provided with the Phase I Report). All “J” qualified data was included in the preliminary screening presented in the Phase I Report, and will be used in the baseline risk assessment. The constituents detected in each SWMU and AOC are shown in Tables 4-3a, 4-4a, 4-5a, and 4-6a. Also, see response to General Comment 12.
 - (viii) The wells at SWMU 6 which the agency has identified in Specific Comment 42 as historically having constituent concentrations above screening criteria were sampled during Phase I of the RFI. The RFI data have been evaluated to identify the presence of potential “contaminant plumes”, and additional investigation of these areas has

been proposed, as appropriate, in the Phase II RFI Work Plan.

- (ix) None of the concentrations in monitoring well SW-3D exceed the relevant screening criteria; therefore, the installation of a bedrock well at this location is not necessary.
- (x) The Phase II Work Plan includes installation of a permanent monitoring well in the lacustrine/upper till and upper/lower till zones at location T-1. If the exceedance of total lead is confirmed during Phase II sampling in the permanent upper/lower till monitoring well, then an additional bedrock well will be considered for this location.

The issue of installing an additional well cluster along the north side of SWMU 6 was addressed as part of the NSL RFI. Based on the data evaluation performed during the NSL RFI, the existing well spacing was determined to be adequate for intercepting a potential release from the facility. As such, additional wells along the north side of SWMU 6 are not necessary, since USEPA has previously agreed that characterization of the NSL periphery during the prior RFI is adequate. In addition, none of the concentrations of constituents detected in monitoring wells QD-3S/D/R during the NSL RFI exceeded the relevant screening criteria presented in the recent Phase I RFI Report; therefore, the installation of a well cluster at this location is not necessary.

61. *Section 4.3.4.5, Page 62, Paragraph 1. ESOI states that based on the evaluation of the Phase I results, no further characterization of the landfill cover is warranted. However, during Phase I of the investigation, ESOI determined that the unit boundaries for the Central Sanitary Landfill (SWMU 7) extend west to the eastern boundary of Cell G (SWMU 2) and east to the western boundary with Cell H (SWMU 3). The northern and southern boundaries of SWMUs 6, 7 and 9 extend north almost to the northern property line and south to the City of Toledo waterline. This means that there is waste under the haul roads and other areas (previously identified as outside the unit boundary) surrounding SWMU 7. ESOI has not proposed additional sampling locations on the west side, east side or northeast corner of SWMU 7. ESOI shall revise the Phase II Investigation to include additional sampling locations to assess the adequacy of the cover of these newly discovered waste disposal areas.*

In addition, in-field permeability testing (ASTM D 6391) more accurately depicts the in-field conditions of the cover soils than thin-walled metal tube recovery of relatively undisturbed soil samples (ASTM D 1587) suitable for laboratory testing (ASTM D 5084). As such, ESOI should consider revising the Phase II Work Plan to include the use of the most current version of the Field Measurement of Hydraulic Conductivity Limits (ASTM D 6391) to support the ASTM D 1587/ASTM D5084 data in assessing the permeability of the soils at the designated Phase II sample locations.

Finally, if the objective of the proposed physical properties samples is to demonstrate suitable cover soils in the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9) this will not necessarily mean that corrective measures, such as proper grading and drainage, are not warranted.

See response to General Comment 9 and Specific Comment 59. ESOI agrees that there are insufficient data to assess whether or not on-site haul roads provide adequate cover material over newly identified waste disposal areas, and has for this reason proposed additional geotechnical sampling and analysis of the soil beneath these on-site haul roads during Phase II of the RFI. In addition, another Shelby sample location will be added near the northeast corner of SWMU 7. Data generated from this proposed additional sampling and analysis will be presented in the Phase II RFI report and utilized during the Corrective Measures Study to evaluate what actions may be necessary.

Geotechnical analysis was completed in accordance with the methods and procedures specifically described within the approved RFI Work Plan. ASTM D 6391 (also known as the Boutwell permeameter) is exclusively used to evaluate in-field test pad construction and we are unaware that it has ever been retroactively completed at a closed landfill facility.

62. *Section 4.3.4.5, Page 63, Bullets 1 and 2. SWMU 7 and North side of SWMU 3 Recommendations for Phase II Investigation shall also include the following:*

- i. *Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.*
- ii. *The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.*
- iii. *The re-evaluation shall include comparison of data from water table interface wells and lacustrine/upper till wells along the north side of SWMU 3 to surface water risk values.*
- iv. *The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.*
- v. *Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear*

unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- vi. *Resampling of all bias low data (data qualified UJ) at temporary well locations.*
- vii. *Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes.*
- viii. *Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.*

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- ix. *Investigate cap thickness in hull road near well location T-5. Phase I well log for this location noted 2 feet of clay between gravel road and waste. Ohio EPA noted waste was directly below gravel road base.*
- (i) ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of “child” exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill “MCL gaps”, and the use of such exposure factors would be inconsistent with the USEPA’s procedure for deriving national drinking water standards for noncarcinogens. Table SC 39 presents the EDWLs calculations, including the toxicity values which were used. Recalculation of the EDWLs is not necessary.
- (ii) Existing restrictions on future site use preclude the construction of buildings on SWMU 5. Therefore, it is unnecessary to compare water table interface and lacustrine/upper till data to vapor intrusion criteria. Furthermore, all ground water data have already been compared to MCLs/EDWLs to identify areas for further investigation. According to USEPA, if groundwater concentrations are below MCLs, then quantitative evaluation of the vapor intrusion pathway is not necessary. Therefore, ESOI has already implemented a more stringent screening of shallow (nonpotable) groundwater by using MCLs/EDWLs.

- (iii) Based on the DOCC, there is no indication of a potential release from SWMU 3. Further, RFI data from shallow till wells on the north side of SWMU 3 do not indicate concentrations warranting further investigation. Therefore sampling from SWMU 3 was not included in the approved RFI Work Plan and will not be included for Phase II.
- (iv) As reported in the Phase I RFI Report, groundwater data from the upper till/lower till contact zone wells were compared with MCLs/EDWLs. As indicated in response to subpart (i) above, rescreening of these data is not warranted.
- (v) The purpose of resampling ground water at certain wells is to confirm concentrations measured in Phase I. The objective of the RFI field investigation, as discussed in the RFI Work Plan, is to collect sufficient data to characterize the nature and extent of any release from the ESOI facility. The risk assessment will use data that best represents groundwater conditions at the site, consistent with USEPA guidance on risk assessment. As such, the data used in the risk assessment generally will not consist of only the highest concentrations found at a site.
- (vi) Data that are qualified "UJ" are not "biased low" as suggested in this comment. The "UJ" qualifier means that the data validation procedure determined that the data are reliable enough to confirm that the analytes were not detected, but the limits of detection were less precise than normal. Resampling only because the data are qualified as "UJ" is not consistent with the RFI Work Plan QAPP or standard USEPA QA/QC protocols.
- (vii) The wells at SWMU 7 which the agency has identified in Specific Comment 42 as historically having constituent concentrations above screening criteria were sampled during Phase I of the RFI. The RFI data have been evaluated to identify the presence of potential "contaminant plumes", and additional investigation of these areas has been proposed, as appropriate, in the Phase II RFI Work Plan.
- (viii) As discussed above, no additional data screening is necessary. Step out wells at locations where contaminant concentrations exceed the screening criteria have already been proposed in the Phase II Work Plan.
- (ix) An addition cover investigation boring will be added near T-5.

63. *Section 4.3.7.5, Page 72. Include the following revisions in SWMU 12 Recommendations for Phase II Investigation:*

- i. *Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.*
- ii. *The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.*

- iii. *The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.*
 - iv. *Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.*
 - v. *Resampling of all bias low data (data qualified "UJ") at bubble well locations.*
 - vi. *Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria.*
- (i) ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of "child" exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill "MCL gaps", and the use of such exposure factors would be inconsistent with the USEPA's procedure for deriving national drinking water standards for noncarcinogens. Table SC 39 presents the EDWLs calculations, including the toxicity values which were used. Recalculation of the EDWLs is not necessary.
 - (ii) Existing restrictions on future site use preclude the construction of buildings on SWMU 5. Therefore, it is unnecessary to compare water table interface and lacustrine/upper till data to vapor intrusion criteria. Furthermore, all ground water data have already been compared to MCLs/EDWLs to identify areas for further investigation. According to USEPA, if groundwater concentrations are below MCLs, then quantitative evaluation of the vapor intrusion pathway is not necessary. Therefore, ESOI has already implemented a more stringent screening of shallow (nonpotable) groundwater by using MCLs/EDWLs.
 - (iii) As reported in the Phase I RFI Report, groundwater data from the upper till/lower till contact zone wells were compared with MCLs/EDWLs. As indicated in response to subpart (i) above, rescreening of these data is not warranted.

- (iv) The purpose of resampling ground water at certain wells is to confirm concentrations measured in Phase I. The objective of the RFI field investigation, as discussed in the RFI Work Plan, is to collect sufficient data to characterize the nature and extent of any release from the ESOI facility. The risk assessment will use data that best represents groundwater conditions at the site, consistent with USEPA guidance on risk assessment. As such, the data used in the risk assessment generally will not consist of only the highest concentrations found at a site.
- (v) Data that are qualified “UJ” are not “biased low” as suggested in this comment. The “UJ” qualifier means that the data validation procedure determined that the data are reliable enough to confirm that the analytes were not detected, but the limits of detection were less precise than normal. Resampling only because the data are qualified as “UJ” is not consistent with the RFI Work Plan QAPP or standard USEPA QA/QC protocols.
- (vi) As discussed above, no additional data screening is necessary. Step out wells at locations where contaminant concentrations exceed the screening criteria have already been proposed in the Phase II Work Plan.

64. *Section 4.3.11.2, Page 80, Bullet 1. The text states that the flow direction of water in the monitoring/dewatering trenches along the Toledo water lines will be determined. The Phase I Report does not report the findings for this investigation activity.*

The RFI Phase I Report should be revised to include the flow direction of water in the trenches along the Toledo water lines.

The RFI Phase I Report will be revised to show the apparent flow direction in the monitoring trenches. The low point in Trench I is at Sump I-2 (576.68 msl), meaning that flow within this trench is toward the center, westerly from Sump I-3 and easterly from Sump I-1. The low point in Trench II and III is at Sump II-1 (576.47 msl) and Sump III-1 (576.35), respectively; therefore flow is westerly within Trenches II and III. The low point in Trench IV and V is at Sump IV-2 (568.29 msl) and Sump V-2 (567.22 msl), respectively; therefore flow is easterly within Trenches IV and V. The low point in Trench VI is at Sump VI-1 (565.15 msl); therefore flow is also assumed to be easterly within Trench VI.

65. *Section 4.3.11.5, Page 88, Bullets 1, 2 and 3 and Page 89, Bullet 1. Investigation Unit A, Recommendations for Phase II Investigation shall also include the following:*

- i. *Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.*
- ii. *The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.*

- iii. *The re-evaluation shall include comparison of data from trench sumps that discharge to the ground surface, water table interface wells and lacustrine/upper till wells to surface water risk values (ground water to storm sewers along York street, to Otter Creek).*
- iv. *The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.*
- v. *Resampling to confirm any exceedance based on the re-evaluation discussed above.*
- vi. *Resampling of all bias low data (data qualified "UJ") at temporary well locations.*
- vii. *Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.*

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- (i) ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of "child" exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill "MCL gaps", and the use of such exposure factors would be inconsistent with the USEPA's procedure for deriving national drinking water standards for noncarcinogens. Table SC 39 presents the EDWLs calculations, including the toxicity values which were used. Recalculation of the EDWLs is not necessary.
- (ii) Existing restrictions on future site use preclude the construction of buildings on SWMU 5. Therefore, it is unnecessary to compare water table interface and lacustrine/upper till data to vapor intrusion criteria. Furthermore, all ground water data have already been compared to MCLs/EDWLs to identify areas for further investigation. According to USEPA, if groundwater concentrations are below MCLs, then quantitative evaluation of the vapor intrusion pathway is not necessary. Therefore, ESOI has already implemented a more stringent screening of shallow (nonpotable) groundwater by using MCLs/EDWLs.
- (iii) The only water from the Waterline trenches that is discharged to the ground surface is the water pumped from Trenches I, II, and VI. Once discharged to the ground, this

water drains to surface water retention ponds at the ESOI facility, which are regularly monitored for compliance with NPDES permit requirements. Therefore, the effect of water discharges from Trenches I, II, and VI on surface water, if any, is monitored on a regular basis as part of ESOI's NPDES permit compliance monitoring, and additional evaluation is unnecessary. Further, direct sampling of water from the Trench I, II, and VI monitoring trenches as part of the Phase I RFI did not identify any constituents that warrant further investigation.

- (iv) As reported in the Phase I RFI Report, groundwater data from the upper till/lower till contact zone wells were compared with MCLs/EDWLs. As indicated in response to subpart (i) above, rescreening of these data is not warranted.
- (v) As discussed above, no rescreening is necessary; therefore, no additional sampling will be needed.
- (vi) Data that are qualified "UJ" are not "biased low" as suggested in this comment. The "UJ" qualifier means that the data validation procedure determined that the data are reliable enough to confirm that the analytes were not detected, but the limits of detection were less precise than normal. Resampling only because the data are qualified as "UJ" is not consistent with the RFI Work Plan QAPP or standard USEPA QA/QC protocols.
- (vii) As discussed above, no additional data screening is necessary. Step out wells at locations where contaminant concentrations exceed the screening criteria have already been proposed in the Phase II Work Plan.

66. *Section 4.3.11.3, Page 81, Bullet 0. ESOI notes that during the installation of T-42, an on-site water line was broken. ESOI shall revise the RFI Phase I Report to note that the soil was stained in and around the water line.*

ESOI concurs and the Phase I RFI report will be revised to note the presence of stained soils in the vicinity of the out-of-service water line encountered at this location.

67. *Section 4.3.11.3, Page 83, Paragraph 2. ESOI states that "there is no separation between SWMU 6, 7, and 9." ESOI shall also state that the boundary of these connected units extends north from the North Sanitary Landfill (SWMU 6) to the property line; south from the New Oil Pond (SWMU 9) to the City of Toledo waterline; west of SWMU 6, the Central Sanitary Landfill (SWMU 7), and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 to the property line and the western boundary with Cell H (SWMU 3).*

The text will be revised as follows: "...the boundary of these connected units extends north from the Northern Sanitary Landfill (SWMU 6) toward ESOI's north property line; south from the New Oil Pond (SWMU 9) to the northern edge of the City of Toledo's raw waterline easement; west of SWMU 6, the Central Sanitary Landfill (SWMU 7) and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and the sheet piling wall on the east side of Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 toward ESOI's eastern property line and Cell H (SWMU 3)."

68. *Section 4.3.11.5, Page 89, Soils. The boring log for location T-54 indicates that there is "some black staining from 10 feet to 13 feet". ESOI shall revise the Phase II Work Plan to include additional investigation of the extent of noted staining, and sampling and analysis of the stained area for the Phase I Parameter List.*

The 10 to 13-foot depth interval at boring location T-54 was below the saturated zone encountered during RFI implementation at this location. A temporary monitoring well was set and in accordance with approved Phase I RFI Work Plan, a groundwater sample (Sample No. GW-F20C7P1-111302-NAB-263) was collected which characterized this stained zone. No additional investigation is warranted based upon this Phase I RFI data.

Also, refer to the response to Specific Comment-94g.

69. *Section 4.3.11.5, Page 90, Bullet 2. ESOI has proposed to determine if any contaminant migration from SWMU 8 is occurring along the water line by collecting a soil sample from below the invert pipe west of SWMU 8 and analyzing the sample for the Phase I Parameter list. Appendix G, Water Line Figure for SWMU 8, shows a 6" sewer line going to the storm sewer catch basin. The figure indicates that the sewer line has been blocked off. However, as this is a preferential contaminant migration pathway, like the water line, ESOI shall conduct additional soil sampling to determine if contamination has migrated off-site along this pathway. Revise the Recommendations for Phase II Investigation to include additional sample locations at each end of the sewer line and analyze for the Phase I Parameter List.*

The layout presented in Appendix G and prior field reconnaissance was considered in developing the Phase II sampling plan. Based on this work, it is believed that this storm sewer is within the limits of SMWU 8. However, ESOI will revised the Phase II Work Plan to include additional investigation in this area to verify the location of the storm sewer. If the storm sewer is found to extend beyond the limits of SMWU 8, then sampling will be conducted to verify that this sewer is not a migration pathway.

70. *Section 4.3.12.3, Page 93, Paragraph 1. ESOI states that "there is no separation between SWMUs 6, 7, and 9." ESOI shall also state that the boundary of these connected units extends north from the North Sanitary Landfill (SWMU 6) almost to the property line; south from the New Oil Pond (SWMU 9) to the City of Toledo waterline; west of SWMU 6, the Central Sanitary Landfill (SWMU 7), and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 almost to the property line and to the western boundary with Cell H (SWMU 3).*

The text will be revised as follows: "...the boundary of these connected units extends north from the Northern Sanitary Landfill (SWMU 6) toward ESOI's north property line; south from the New Oil Pond (SWMU 9) to the northern edge of the City of Toledo's raw waterline easement; west of SWMU 6, the Central Sanitary Landfill (SWMU 7) and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and the sheet piling wall on the east side of Cell G (SWMU 2);

and east of SWMUs 6, 7 and 9 toward ESOI's eastern property line and Cell H (SWMU 3)."

71. *Section 4.3.12.5, Page 96, Paragraph 1. ESOI states based on the evaluation of the Phase I results, no further characterization of the landfill cover is warranted. However, during Phase I of the investigation, ESOI determined that the unit boundary for SWMU 9 extends west to the eastern boundary of Cell G (SWMU 2), east to the western boundary with Cell H (SWMU 3), and south to the City of Toledo Waterline. The northern boundary of SWMUs 6, 7, and 9 extends north almost to the northern property line. This means that there is waste under the haul roads and other areas (previously identified as outside the unit boundary) surrounding SWMU 9. ESOI has not proposed additional sampling locations on the north side, southwest corner or the east side of SWMU 9. Revise the Phase II Investigation to include additional sampling locations to assess the adequacy of the cover on these newly discovered waste disposal areas.*

In addition, in-field permeability testing (ASTM D 6391) more accurately depicts the in-field conditions of the cover soils than thin-walled metal tube recovery of relatively undisturbed soil samples (ASTM D 1587) suitable for laboratory testing (ASTM D 5084). As such, ESOI should consider using the most current version of the Field Measurement of Hydraulic Conductivity Limits (ASTM D 6391) to support the ASTM D 1587/ASTM D5084 data in assessing the permeability of the soils at the designated Phase II sample locations.

Finally, if the objective of the proposed physical properties samples is to demonstrate suitable cover soils in the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9) this will not necessarily mean that corrective measures, such as proper grading and drainage, are not warranted.

See response to General Comment 9 and Specific Comment 59. ESOI agrees that there are insufficient data to assess whether or not on-site haul roads provide adequate cover material over newly identified waste disposal areas, and has for this reason proposed additional geotechnical sampling and analysis of the soil beneath these on-site haul roads during Phase II of the RFI. Data generated from this proposed additional sampling and analysis will be presented in the Phase II RFI report and utilized during the Corrective Measures Study to evaluate what actions may be necessary.

Geotechnical analysis was completed in accordance with the methods and procedures specifically described within the approved RFI Work Plan. ASTM D 6391 (also known as the Boutwell permeameter) is exclusively used to evaluate in-field test pad construction and we are unaware that it has ever been retroactively completed at a closed landfill facility.

ESOI has already proposed additional geotechnical sampling and analysis of cover soils beneath on site haul roads associated with the SWMU limits (as defined during Phase I of the RFI (also refer to the response to General Comment 9 and Specific Comment 61).

Refer to the response to Specific Comment 58 regarding the response to permeability testing in accordance with method ASTM D 6391.

72. *Section 4.3.12.5, Page 97, Bullets 1 and 2. Investigation Unit B, Recommendations for Phase II Investigation shall also include the following:*

- i. *Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.*
- ii. *The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.*
- iii. *The re-evaluation shall include a comparison of surface water risk values to data from trench sumps that discharge to the ground surface, to water table interface wells, and to lacustrine/upper till wells to surface water risk values (ground water to storm sewers along York street which discharge to Otter Creek).*
- iv. *The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.*
- v. *Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.*
- vi. *Resampling of all bias low data (data qualified UJ) at temporary well locations.*
- vii. *Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface*

water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- (i) ESOI followed USEPA methodology and exposure factors for calculating the EDWL values. ESOI does not agree with the use of “child” exposure factors as suggested in Specific Comment 39, because the EDWLs are intended to fill “MCL gaps”, and the use of such exposure factors would be inconsistent with the USEPA’s procedure for deriving national drinking water standards for noncarcinogens. Table SC 39 presents the EDWLs calculations, including the toxicity values which were used. Recalculation of the EDWLs is not necessary.
- (ii) Existing restrictions on future site use preclude the construction of buildings on SWMU 5. Therefore, it is unnecessary to compare water table interface and lacustrine/upper till data to vapor intrusion criteria. Furthermore, all ground water data have already been compared to MCLs/EDWLs to identify areas for further investigation. According to USEPA, if groundwater concentrations are below MCLs, then quantitative evaluation of the vapor intrusion pathway is not necessary. Therefore, ESOI has already implemented a more stringent screening of shallow (nonpotable) groundwater by using MCLs/EDWLs.
- (iii) The only water from the Waterline trenches that is discharged to the ground surface is the water pumped from Trenches I, II, and VI. Once discharged to the ground, this water drains to surface water retention ponds at the ESOI facility, which are regularly monitored for compliance with NPDES permit requirements. Therefore, the effect of water discharges from Trenches I, II, and VI on surface water, if any, is monitored on a regular basis as part of ESOI’s NPDES permit compliance monitoring, and additional evaluation is unnecessary. Further, direct sampling of water from the Trench I, II, and VI monitoring trenches as part of the Phase I RFI did not identify any constituents that warrant further investigation.
- (iv) As reported in the Phase I RFI Report, groundwater data from the upper till/lower till contact zone wells were compared with MCLs/EDWLs. As indicated in response to subpart (i) above, rescreening of these data is not warranted.
- (v) The purpose of resampling ground water at certain wells is to confirm concentrations measured in Phase I. The objective of the RFI field investigation, as discussed in the RFI Work Plan, is to collect sufficient data to characterize the nature and extent of any release from the ESOI facility. The risk assessment will use data that best represents groundwater conditions at the site, consistent with USEPA guidance on

- risk assessment. As such, the data used in the risk assessment generally will not consist of only the highest concentrations found at a site.
- (vi) Data that are qualified “UJ” are not “biased low” as suggested in this comment. The “UJ” qualifier means that the data validation procedure determined that the data are reliable enough to confirm that the analytes were not detected, but the limits of detection were less precise than normal. Resampling only because the data are qualified as “UJ” is not consistent with the RFI Work Plan QAPP or standard USEPA QA/QC protocols.
 - (vii) As discussed above, no additional data screening is necessary. Step out wells at locations where contaminant concentrations exceed the screening criteria have already been proposed in the Phase II Work Plan.

73. *Section 4.3.13.1, Page 99, Paragraph 2. Add to this paragraph that U.S. EPA did not concur with or approve the NSL ecological assessment or its conclusions.*

The statement will be included as part of the detailed ERA to be performed after the completion of the Phase II field investigation.

74. *Section 4.4, Page 103, Paragraph 1. ESOI states that “Upper-bound estimates of cumulative cancer risk and noncancer HI for potential exposure of routine workers to on-site soil are calculated based on the maximum concentrations detected in soil at any depth in each area investigated.” This is misleading as the full rate and extent of each area investigated has not been determined. Therefore, ESOI cannot assume that the maximum concentrations have been found. In addition, ESOI states that conservative risk-based screening criteria “are derived from USEPA Region 9 risk-based PRGs for soil.” USEPA approved the use of Region 9 PRGs in the RFI Work Plan. Therefore, ESOI may not use derived comparison standards. Finally, the criteria for screening out investigation areas for “no further action” is established in the RFI Work Plan. ESOI may not make “no further action” determinations based on preliminary cumulative risk calculations.*

In addition, ESOI shall provide to U.S. EPA, for approval, all baseline risk assessment calculations that will be used in the baseline risk assessment at least 60 days prior to the release of the Phase II Report.

Refer to response to Specific Comments 9 (risk targets and purpose of screening) & 13 (preliminary risk estimates). The screening results and preliminary risk estimates provide part of the basis for the need for interim measures. As discussed in the RFI Work Plan, these results are not being used to eliminate areas from consideration in the risk assessments or the corrective action study.

The text will be modified to clarify that the maximum detected concentration from the Phase I RFI was used (recognizing that certain locations are still be investigated). However, in the areas where no further sampling is warranted this is not a preliminary evaluation.

75. *Section 4.4, Page 104, Paragraph 1. It is U.S. EPA policy that if a state has a clearly defined risk number, then the EPA will adhere to the state policy. Ohio EPA has two risk goals, one for screening to address cumulative risk and one for cleanup level. For screening for cumulative risk, Ohio EPA uses a more conservative $10E-6$ and an HI of 0.1. Ohio EPA's baseline risk assessment goal for cumulative cancer risk is $10E-5$ and an HI of 1 for non cancer effects (Ohio EPA 1999).*

See responses to Specific Comment 9 and Specific Comment 37.

76. *Section 4.5.1.4, Page 107, Paragraph 1. ESOI states that "an assessment of Otter Creek conducted by the USEPA in 1976 concluded that the lower two-thirds of Otter Creek was not conducive to supporting or maintaining aquatic biota." As this study was conducted 27 years ago it is not relevant to the current investigation. ESOI must strike this sentence.*

This information is consistent with language in the approved DOCC and RFI Work Plan, and provides background for the current assessment. This information is not being used to eliminate Otter Creek from a more detailed assessment. Therefore, it should be retained for background purposes.

77. *Section 4.5.2.1, Table 4.14, Table 4.15. Region V EDQLs (ESLs) are based on exposure to one contaminant. As such, when multiple chemicals that likely have the same mechanism of effect (e.g., DDD/DDE/DDT, PAHs, metals) are present, the screening levels should be adjusted accordingly. ESOI shall revise the RFI Phase I Report and Phase II Work Plan to reflect these adjusted levels (i.e., ESL divided by the number of grouped contaminants).*

ESOI requests specific guidance and precedence for the approach to adjusting EDQL values for multiple chemicals that may have similar effects in wildlife. The approach used for screening contaminants of potential ecological concern was consistent with the RFI Work Plan accepted by the USEPA. As defined in the Work Plan, during the initial screen, the maximum measured concentration in various media was compared against the EDQLs. Because the EDQLs were exceeded, ESOI evaluated alternative screening benchmarks agreed to by the agency in advance were used to further to evaluate chemical levels in soil, sediment, and surface water.

78. *Section 4.5.2.2, Page 111, Bullet 2. ESOI states that "The available information indicates that there are no aquatic ecological receptors." This statement is not accurate. Aquatic ecological receptors were identified in the storm water retention basins (i.e., turtles, frogs, and toads) and drainage ditches on the ESOI facility. ESOI shall revise the RFI Phase I Report to correct this discrepancy.*

This statement in the Phase I Report will be modified as requested.

79. *Section 4.5.3, Page 112, Paragraph 1. ESOI states that "...three organic chemicals (2,4,5-*

trichlorophenol, 2-butanone, and benzene) detected in Otter Creek are not detected in soil and sediment or surface water at SWMU 5.” Benzene was detected in shallow soil samples and deep soil samples at SWMU 5. ESOI shall strike the reference to benzene in this paragraph.

This statement in the Phase I Report will be modified as requested.

80. *Section 4.5.3, Page 113, Paragraph 0. ESOI states that the “available information indicates that chemicals at SWMU 5 are not likely migrating to a substantial and measurable degree to Otter Creek.” ESOI further states that “If surface water runoff to Otter Creek from SWMU 5 is evident, then it is likely the COPCs do not contribute significantly to the levels in sediments and surface water relative to the contributions from sources upstream of the ESOI Facility.” Based on the history of Otter Creek it is understandable that ESOI would reference upstream sources, however, ESOI is still responsible for any contamination from the ESOI facility that is above ecological screening levels. Therefore, the significance of ESOI’s contribution to the contamination in Otter Creek relative to upstream sources is irrelevant. ESOI shall clarify that it is understood that the facility is responsible for its contribution to contamination in Otter Creek irrespective of upstream sources.*

ESOI acknowledges that it is responsible for assessing the significance of releases from the ESOI facility to Otter Creek. If a significant release from the ESOI facility to Otter Creek is occurring, ESOI will take appropriate measures to mitigate the release. If a release from the ESOI facility to Otter Creek has occurred in the past, its significance and corrective action decisions regarding Otter Creek must consider the existing uses and conditions in Otter Creek, including all influences on Otter Creek that are unrelated to the ESOI facility.

81. *Section 4.5.3, Page 113, Bullets 2 and 3. ESOI mentions screening against background levels at AOC 9 (Cell M Storm Water Basin) and the NPDES outfalls. There are no established background levels for either of these surface water sources. ESOI shall strike the reference to “background levels.”*

USEPA approved the use of data from background locations to screen chemicals at AOC 9 and the NPDES outfalls. Background (reference) locations were agreed upon by Ohio EPA prior to sample collection (see response to Specific Comment 5).

82. *Section 4.5.4, Page 114, Paragraph 0. ESOI states that “available sampling results suggest that the occurrence of chemicals in Otter Creek are not related to releases of hazardous constituents from the ESOI Facility.” Directly after this statement, ESOI indicates that additional sediment sampling is warranted. ESOI cannot make final determinations about the relationship of Otter Creek contamination and releases of hazardous constituents from the ESOI facility until the investigation is complete. Therefore, ESOI shall strike this sentence.*

ESOI did not intend to make a final decision regarding the relationship between Otter Creek contamination and potential releases from the ESOI facility. Rather, the statement was intended to indicate that data currently available from the Phase I of the RFI suggest that the occurrence of chemicals in Otter Creek are not related to release of hazardous constituents from the ESOI Facility. As indicated in the RFI Phase I Report and Phase II Work Plan, ESOI recognizes that additional information is required to make a final decision regarding the relationship between contamination in Otter Creek and SWMU 5, and has proposed additional sampling within Otter Creek for this purpose.

83. *Section 4.5.4, Page 115, Bullet 1. The depth of the proposed samples is not indicated. Due to the multitude of current and historical sources of environmental contaminants within the watershed it will be very difficult, but necessary, to clearly demonstrate that ESOI has or has not had an impact to sediment in Otter Creek. Surface sediments collected during the sampling phase will not address the potential historical impacts from the site. Since ESOI has already identified an area in Otter Creek requiring further investigation, deeper sediment sampling is warranted to help determine if offsite migration from SWMU 5 to Otter Creek has occurred. ESOI must revise the Sampling Recommendations for Ecological Investigation to include sediment sampling depths.*

Consistent with the sampling approach approved for the Phase I RFI, sediment samples will be collected from a depth of 0 to 6 inches. This sampling approach was developed based on the expected use of the data in the human health and ecological risk assessments. In both cases, exposures to surface sediments are more likely; exposures to deeper sediments is not generally expected. An evaluation of deeper sediments can be used for characterization purposes, but these data are expected to provide little insight into potential historical impacts from the site. Specifically, the use of deeper sediment data for evaluating historical impacts will be confounded with uncertainties that cannot be quantified, such as the documented upstream contaminant sources. Because the primary purpose of the RFI is to identify releases from the facility that warrant corrective actions, the sampling program is focused on gathering data to support the human health and ecological risk assessments under current and reasonably likely future exposure conditions.

Also, see response to Specific Comment 80.

84. *Section 5.0. ESOI shall revise this section to include a discussion of the Phase II sampling strategy and to clearly state the endpoints for determining the nature and extent of constituents in soil, sediment, surface water and/or ground water. The endpoints shall be based on the most conservative human health or ecological risk screening criteria.*

Section 5 will be revised to include a discussion of the Phase II sampling strategy.

85. *Section 5.1, Page 116. The text states that additional data will be collected to determine the nature and extent of constituents in soil, sediment, surface water and/or ground water at certain SWMUs and AOCs, as necessary to support a baseline risk assessment.*

The baseline risk assessment must account for additive risk and include all data above background. This means that some areas that passed screening may fail the baseline risk assessment. Also, the baseline risk assessment may identify contaminant plumes where the Phase I and II data do not define the full extent of the area exceeding risk. The full extent of the area exceeding risk must be defined before corrective measures are proposed and evaluated.

ESOI shall revise the Phase II Work Plan to state that the baseline risk assessment will include additive risk for all constituents found above background. Also, the Phase II Work Plan should recognize that multiple well installations with sampling and analysis may be needed to define the full extent of areas failing the baseline risk and to define the full vertical and horizontal extent of areas exceeding background. Therefore, the Phase II Work Plan schedule presented in Table 5.1 may need to be revised to account for multiple well installations.

The scope of the human health risk assessment was previously approved as part of the RFI Work Plan (see Section 4.3.1). See response to Specific Comment 38 (adding risks across units).

Regarding handling of background concentrations, to streamline decisions during the RFI field investigation and to avoid unnecessary data collection, the site-related component of metals in the soil characterization data was estimated based on data collected during the Phase I event. Consistent with ENVIRON and USEPA discussions regarding streamlining the RFI process at other sites, the estimated background component was then subtracted from the maximum concentration of the metal in an area of interest (AOI) before the maximum concentration is compared to screening criteria. This comparison is done by calculating ratios of the site-related maximum concentration to the cancer- and/or noncancer-based criterion separately, so that the ratios can be used to estimate cumulative cancer and noncancer risks. These calculations are done for all detected metals, although a ratio would be zero if the maximum concentration is lower than the background level.

This approach is mathematically equivalent to calculating cumulative cancer and noncancer risk estimates due to background contributions alone, calculating the estimates for the combined background and site-related contributions, and then taking the difference between these two sets of estimates to calculate site-related risks. The advantage of the streamlined approach is that it is able to obtain the estimates of site-related cumulative risks without explicitly calculating the estimates of background risk and the combined background and site-related risks. For decision-making regarding the need for corrective measures, the explicit estimation of risks due to background alone and due to background plus site is unnecessary, because the risk triggers for corrective measures are based on only site-related risks, as specified in OSWER Directive 9355.0-30.

RFI delineation vs. delineation for corrective measures and the inherent conservative assumptions which are made during the data screening process during the RFI: The site characterization strategy in the initial phase of a RFI field investigation generally relies on judgmental sampling to identify locations where a release, if present, would most likely be found. The initial samples are biased to locations where higher concentrations are most likely,

based on information on past operations and potential mechanisms of release. If the initial samples show the presence of concentrations higher than the screening criteria, additional samples would be taken to delineate the extent of the release. A data set from such sampling would generally include relatively few concentrations higher than the screening criteria and more concentrations lower than the screening criteria. It is possible that data from this sampling approach are high-biased as compared to random sampling. However, as discussed above, these data would be expected to provide a more conservative estimate of the true mean than data from random samples. For risk assessment purposes, these high-biased estimates can be used because they are more conservative than estimates based on a random sample. This is the same reason that the highest concentration in a data set is often used as an expedient and conservative estimate of the true mean (i.e., the highest concentration in data from high-biased or random samples is reasonably likely to be higher than the true mean).

The schedule for the Phase II Work Plan will be revised to include adequate time for completing all of the site investigation activities necessary during the RFI.

86. *Table 4.2. ESOI shall revise Table 4.2 of the RFI Phase I Report to include a separate column and associated information for Probe ID and SWMU.*

The first column in Table 4.2 includes the explosive gas Probe ID. A new column will be added to indicate the SWMU with which each probe is associated.

87. *Table 4.3a. It appears that ESOI subtracted the site specific background concentrations from the measured concentrations before comparing the measured concentrations to the risk-based screening criteria. When the concentrations of site-samples are compared to risk-based screening criteria, the full measured constituent concentration of the sample must be used. Revise the RFI Phase I Report to show a comparison of risk-based screening criteria to the full measured constituent concentration.*

See response to Specific Comment 85.

88. *Table 4.7b.*

a. *It is not clear why “potential risk drivers are identified as those chemicals that have a cancer risk greater than 5×10^{-6} and HQ greater than 0.1.” Revise the RFI Phase I Report to explain why this cancer risk endpoint was chosen.*

b. *Napthalene is identified as a chemical with a high contribution to potential risk estimates for soil at SWMU 6. Revise the RFI Phase I Report to explain why this chemical and its detected concentrations do not show up in a data box on figure 4.2-2 or 4.2-3.*

a. The text will be revised to clarify the identification of constituents that are likely to contribute most significantly to the cumulative risk estimate.

b. Only chemicals that exceeded specific criteria are presented on databox figures (as explained in Section 4.2.2.2). The purpose of reviewing the preliminary cumulative risk estimates is to identify other constituents that don't exceed specific criteria for further review.

89. *Table 4.11 and Data Summary Tables. Sediment data for PAHs would be more meaningful if values below the reporting level were reported as actual numbers along with the "J" qualifier. Provided these numbers if available in the laboratory's records.*

Table 4.11 is a summary of screening results by SWMU/IA for detected constituents in sediment, and provides the minimum, mean and maximum concentrations for these detected constituents in each area where sediment samples were collected. For those constituents having a maximum concentration above a screening criteria, the sample-by-sample results are listed on Table 4.12. If an estimated concentration in a specific sample was reported, it is identified in the "Qual" column on Table 4.13.

90. *Tables 4.13 and 4.14. Table 4.13 is titled "Groundwater Samples Taken Near Surface Water...." Table 4.14 is titled "Sediment Samples Exceeding Screening Criteria." The Table of Contents indicates the opposite. ESOI shall revise the RFI Phase I Report to correct this discrepancy.*

The RFI Report will be revised to correct the discrepancy in Table numbers.

91. *Table 5.1, Summary of Phase II RFI Sample Collection and Analysis by Investigation Unit.*

a. *Page 2 of 3 lists "COPC" under the Lab Parameters column. EOSI must include a note that identifies what the COPCs are.*

The RFI Report will be revised to list the COPCs.

b. *Additional sediment samples should be evaluated for grain size analysis and Total Organic Carbon (not specifically addressed in this table). These associated analyses provide important context for evaluating results of chemical contamination.*

TOC and grain size will be added for the Phase II sediment samples.

92. *Figure 5.1.*

a. *The RFI Phase I Report has two figures labeled 5.1. The figure titled ESOI Otter Creek Road RFI Schedule should be labeled 5.2 to agree with the Table of Contents.*

The RFI Schedule will be revised to Figure 5.2 to correspond to the Table of Contents.

- b. *The title on figure 5.1 is "Proposed Phase II Sampling Plan, North of York Street." The Table of Contents indicates that the title of figure 5.1 is "Phase II RFI Sampling Plan." ESOI shall clarify this discrepancy.*

The Table of Contents and Figure 5.1 will be revised to indicate that the title of the figure is "Proposed Phase II Sampling Plan".

- c. *Soil Boring Numbers S10-39, S10-40 and S10-41 indicate that there is waste and/or staining and/or petroleum odor in each of these borings which are located between SWMU 10 and AOC 1. Figure 5.1 also defines the SWMU limits as shown on the RFI Work Plan in green and the SWMU limits based upon Phase I of the RFI in purple. It is not clear why the area between SWMU 10 and AOC 1 has not been included within the SWMU limits. ESOI must include this area within the limits of a unit.*

S10-39 is identified within the waste limits for the "Fondessy Unit" (i.e., purple line), as denoted within Figure 5.1 of the Phase I RFI report..

Soil boring S10-40 correctly shows waste from 7 to 20 feet in depth and will be included within the revised footprint of SWMU No. 10.

Soil boring S10-41 correctly describes waste including black cinders, brick fragments and oil staining from 8 to 10 feet in depth and will be included within the revised footprint of SWMU No. 10.

93. *Figure 5.2. ESOI has scheduled 40 work days for the Phase II investigation. Given the number of comments generated during the Agency's review of ESOI RFI Phase I Report and Phase II Work Plan and the additional sampling required by these comments, ESOI should consider revising the Phase II schedule.*

ESOI will revise the schedule to allow for adequate time to complete the proposed Phase II investigation activities. Assuming 3 subphases for Phase II consisting of field work (30days), data analysis (30days), data review(30days), and ending with a review meeting with EPA, then Phase II should be about 270 days.

94. *Appendix C, Field Notes and Boring Logs.*

- a. *Soil Boring Number: AOC 4-1. The boring log does not match the field notes for 10/3/02. ESOI shall revise the boring log to reflect what is present in the field notes for 10/3/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.*

The boring log for AOC 4-1 appears to be generally the same as the field notes with only a few minor differences attributable to standard editing practices during transcription. However, the boring log will be revised to exactly correspond to the field notes.

- b. Soil Boring Number: S1-3. The boring log does not match the field notes for 8/12/02. ESOI shall revise the boring log to reflect what is present in the field notes for 8/12/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.*

This is a typographical error. The boring log is misidentified and should be S1-38. The boring log will be revised.

- c. Soil Boring Number: T-37W, T-37S. The boring log does not match the field notes for 09/11/02. ESOI shall revise the boring log to reflect what is present in the field notes for 09/11/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.*

The boring log is correct. There is an erroneous entry within the field notes for 09/11/02 whereby the field staff (NAB) mistakenly referred to T-36 instead of T-37. The entry within the field notes will be edited with a single strikethrough, dated and provided with the revised Phase I RFI report.

- d. Soil Boring Number: T-17S. The boring log notes for this location do not appear to be included in the report. ESOI shall revise the RFI Phase I Report to include the field notes for this location.*

ESOI concurs and will provide the field notes for this date and soil boring location.

- e. Soil Boring Number: S5-21. The boring log does not match the field notes for 09/26/02. ESOI shall revise the boring log to reflect what is present in the field notes for 09/26/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.*

The boring log for S5-21 appears to be generally the same as the field notes with only a few minor differences attributable to standard editing practices during transcription. However, the boring log will be revised to exactly correspond to the field notes.

- f. Soil Boring Number: T-21S. The boring log indicates that there is "some black staining from 15 -15.5 feet." ESOI shall do additional investigation of the extent of noted staining and sample/analyze the stained area in Phase II of the RFI.*

Refer to the response to Specific Comment-54.

- g. *Soil Boring Number: T-54. The boring log indicates that there is "some black staining from 10-13 feet. ESOI collected samples at this location from three intervals, 0-6", 4-6' and 7.5-9.5'. It is not clear why ESOI did not collect a sample from the 10 -13 foot interval where the staining was noted. ESOI shall do additional investigation of the extent of the noted staining and sample/analyze the stained area in Phase II of the RFI.*

The boring log for T-54 documents the initial soil boring which was installed to characterize the limits of waste around SWMU 8. In accordance with the approved RFI work plan, a "step-out" boring was installed and it was from this "step-out" boring that the sample from 7.5 to 9.5 feet in depth was collected from the interval registering the highest OVA field screening reading. In accordance with the approved RFI work plan, waste was never intended to be sampled (Refer to the approved RFI work plan, Section 1.3, Page 1-6). In addition, "black stained" soils were not encountered in the 10-13-foot depth interval at the "step-out" soil boring location, and this depth interval was noted to be beneath the saturated zone. In accordance with the approved RFI work plan objectives (Section 3.2.2) and specific scope (Section 3.4.11.4), soil samples were not collected below the first [encountered] saturated zone. A temporary monitoring well was set at location T-54 (first step-out boring) and in accordance with approved Phase I RFI work plan objectives and a groundwater sample (Sample No. GW-F20C7P1-111302-NAB-263) was collected which assisted with the characterization of the extent of contamination at this location. Based upon a review of the RFI Phase I data, no additional investigation is warranted at this location.

- h. *Temporary Monitoring Well Number: T-42W. The date on this boring log is incorrect. T-42W was logged on 8/21/02. ESOI must revise the boring log to reflect the correct date.*

The boring log will be revised to reflect the August 21, 2002 date.

- i. *Soil Boring Number S7-12. There are several step-outs associated with this boring location. Only one step-out has been translated from field notes to a typed boring log. ESOI shall create typed boring logs for all of the step-outs associated with this location.*

Location S7-12 is not identified on any of the figures. ESOI shall revise the RFI Phase I Report to identify this location on all appropriate figures.

The boring log indicates that location S7-12 had 6 feet of leachate in the borehole but there is no indication that a leachate sample was taken. In accordance with the RFI Work Plan (Page 3-4) ESOI was required to take a leachate sample at this location. ESOI shall revise the Recommendations for Phase II Investigation to include a leachate sample from this location and analysis for the Phase I Parameter List or provide an explanation for not taking the sample.

The Phase I RFI field investigation was designed and implemented to define the limits of past solid waste disposal units at ESOI. If waste was encountered at a soil boring location, the waste thickness was determined/logged, the soil boring was abandoned and a "step-out" boring was installed approximately five feet further from the expected limits of the unit. If waste was subsequently encountered in the "step-out" boring, this too was abandoned and subsequent "step-out" borings were installed until either: a) no waste materials were encountered (indicating that the limits of waste had been determined); or b) it was determined that there was no separation between adjacent units (e.g., soil borings installed between SWMU 6 and SWMU 7). There are multiple soil boring locations where a formal boring log was not prepared for every "step-out" soil boring. The information from "step-out" borings was taken into consideration during the preparation of formal boring logs and it is ESOI's opinion that little significant information will be gleaned by preparing a formal soil boring log for every "step-out" boring. Finally, the key information gathered from the step-out borings (i.e., the limits of waste) was presented in the Phase I RFI Report. As needed, the information from the field notes can be used to supplement the data evaluation; for example, a new figure (see Figure 1) has been generated in response to these comments to present information regarding the thickness of the cover soils over SMWUs 6, 7 and 9. ESOI will also provide an additional figure to show the approximate locations of the initial, final and centrally located soil borings in each series.

S7-12 will be added the RFI Phase I report Figures.

The statement from Page 3-4 of the approved RFI Work Plan is from the overall objectives section. The specific scope of sampling was defined for each Area of Interest in Section 3.4. The approved RFI Work Plan specified collecting one leachate sample from each SWMU and the leachate sample had already been collected from SWMU 7.

- j. Soil Boring Number T-42d. The field notes for 8/21/02 indicate that a borehole ending at 10 feet was installed. The boring logs do not include this borehole. ESOI shall revise the RFI Phase I Report to include all of the borings in the boring logs.*

The boring installed on August 21, 2003 was constructed to facilitate sample collection associated with soil boring T-42d. Procedures implemented during the RFI due to sample volume requirements were such that an initial soil boring was installed for logging and field screening. Based upon the data collected from this initial soil boring, a supplemental soil boring was installed from which samples were collected at appropriate depths.

- k. Soil Boring Number: S-7 (T-14a & b). This location is not indicated on figure 4.4-3 or figure 5.1. It is assumed that there is a typo and the location is noted as S9-14 on the figures. ESOI shall revise the RFI Phase I Report to clarify this discrepancy.*

ESOI concurs that the location of S-7 (T-14a) and S9-14 are one in the same. The figures will be revised to identify the soil boring location as S-7 (T-14a). In order to remain consistent with this nomenclature, ESOI notes that the soil boring location and well log identified as S9-13 in the Phase I RFI report will also be revised to S-7 (T-13a).

- l. Temporary Monitoring Well Number: T-4S. The boring log indicates that there is "some black staining from 1.5 - 3 feet." ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sample, and analyze for the Phase I Parameter List.*

The "black staining" noted in the formal boring log and field notes for the installation of T-4S was not considered to be indicative of waste material but of an old roadbed known to be located in this area. If it had been identified as waste material, temporary shallow and deep wells would not have been constructed at this location and additional "step-out" soil borings would have been installed.

- m. Soil Boring Number: S10-44. The boring log indicates that there is "some black staining from 13 to 15 feet, slight" and "some glass, plastic and metal fragments, slough, petroleum odor" from 17 - 22 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sample, and analyze for the Phase I Parameter List.*

The Phase I RFI objectives specifically excluded the sampling and characterization of waste materials. In accordance with the approved RFI Work Plan, if waste was encountered, "step-out" borings were installed to facilitate defining the limits of the unit or area of interest. Subsequent to the installation of S10-44, a temporary monitoring well nest (designated T-44S/D) was subsequently installed in this vicinity, at the location of a "step-out" boring where waste materials were not encountered. The limits of waste have clearly been defined in this vicinity and no further investigation of this type is warranted. Phase II RFI investigation is already proposed to complete additional sampling at temporary monitoring well nest T-44S/D.

- n. Soil Boring Number: S10-40. The boring log indicates that there is "waste, dark brown to black cinder and ash, black sludge like material with sheen, petroleum odor, very soft and moist, black stained cinder and sand with sheen" from 7 - 20 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sample, and analyze for the Phase I Parameter List.*

In addition, it is not clear why ESOI did not include this location within the unit boundary. ESOI shall revise the RFI Phase I Report to include this location within the unit boundary or explain why the location should remain outside the unit boundary.

The Phase I RFI objectives specifically excluded the sampling and characterization of waste materials. In accordance with the approved RFI Work Plan, if waste was encountered, "step-out" borings were to be installed to facilitate defining the limits of the unit or area of interest. In the case of soil boring S10-40, "step-out" soil borings were installed up to the waterline easement Trench IV. The waterline easement trenches were sampled in accordance with Investigation

Area 1, therefore, no additional investigation is warranted.

ESOI concurs that soil boring S10-40 should be shown within the limits of SWMU 10. Refer to the response to Specific Comment-92c.

- o. Soil Boring Number: S10-39. The boring log indicates that there is "waste, gravel, black cinders, brick fragments, ash, oil stains, [and] petroleum odor" from approximately 2.5 - 14 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sampling of the stained area, and analysis for the Phase I Parameter List.*

The Phase I RFI objectives specifically excluded the sampling and characterization of waste materials. In accordance with the approved RFI Work Plan, if waste was encountered, "step-out" borings were to be installed to facilitate defining the limits of the unit or area of interest. In the case of soil boring S10-39 "step-out" soil borings were installed up to the waterline easement Trench III. The waterline easement trenches were sampled in conjunction with Investigation Area 1; therefore, no additional investigation is warranted.

- p. Soil Boring Number: S10-3. The boring log indicates that from 8 - 10 feet there is "black cinders, gravel and ash." ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted ash material, sampling of the ash material and analysis for the Phase I Parameter List.*

The Phase I RFI objectives specifically excluded the sampling and characterization of waste materials. S10-03 was determined to be (and shown within the Phase I RFI report figures) to be within the footprint of SWMU 10. No additional investigation is warranted.

- q. Temporary Monitoring Well Number: T-57S. The boring log indicates that there is "some black staining from 8 - 9.5 feet." ESOI collected a sample from the 6 - 8 foot interval. It is not clear why ESOI did not collect the sample from the area with black staining. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted staining, sampling of the stained and analysis for the Phase I Parameter List.*

The 6 to 8-foot depth interval was sampled due to FID readings and black staining observed during soil boring installation. The 8 to 9.5 -foot depth interval was not sampled as this was beneath the saturated zone in the boring and in accordance with the approved RFI Work Plan, soil samples were not collected from beneath the saturated zone. The water sample collected from T-57S characterized the zone beneath the encountered water table including the 8 to 9.5-foot depth interval. A review of the data associated with Phase I of the RFI does not warrant the need for additional investigation at this location.

- r. *Soil Boring Number: S10-41. The boring log indicates that from 8 - 10 feet there is "black cinder, brick fragments, oil stained". ESOI collected a sample from the 6 - 8 foot interval and ended the borehole at 10 feet. It is not clear why ESOI did not sample the stained area and did not continue the borehole to determine the depth of the waste. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sampling of the stained area, and analysis for the Phase I Parameter List.*

In addition, it is not clear why ESOI did not include this location within the unit boundary. ESOI shall revise the RFI Phase I Report to include this location within the unit boundary or explain why the location should remain outside the unit boundary.

The Phase I RFI objectives specifically excluded the sampling and characterization of waste materials. In accordance with the approved RFI Work Plan, if waste was encountered, "step-out" borings were to be installed to facilitate defining the limits of the unit or area of interest. In the case of soil boring S10-41, "step-out" soil borings were installed up to the waterline easement Trench IV. The waterline easement trenches were sample in conjunction with Investigation Area 1; therefore, no additional investigation is warranted.

ESOI concurs that soil boring S10-41 should be shown within the limits of SWMU 10.

- s. *Temporary Monitoring Well Number: T-59S. The boring log indicates that there is "some black staining from 6.5 - 8.5 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted staining, sampling of the stained area, and analysis for the Phase I Parameter List.*

The 6 to 8-foot depth interval from this boring was sampled during performance of the RFI (Sample No. S-F20C7P1-100302-NAB-223 and duplicate sample ...NAB-224). Based upon a review of the Phase I RFI data, no additional investigation is warranted.

- t. *The RFI Phase I Report does not contain well logs for the following wells: BG-1D; BG-1R; BG-1S; T-1D; T-2D; T-2S; T-8D; T-15D; T-35S; T-42S; and T-54S. Revise the RFI Phase I Report to include well logs for these wells.*

The boring logs will be included with the revised Phase I RFI report.

95. *Appendix E, Survey of Existing Terrestrial and Aquatic Habitats Associated with the RFI. The report indicates that Mannik & Smith utilized the Ohio Rapid Assessment Method (ORAM) for wetlands and the Qualitative Habitat Evaluation Index (QHEI) for streams. ESOI shall revise the Phase I Report to include documentation of personnel training and experience in the use of these methods.*

MSG personnel have been trained by Ohio EPA in order to complete ORAM evaluations for

wetlands and QHEI determinations for streams. Since completing this training, these MSG personnel have successfully completed numerous ORAM and QHEI determinations which have been accepted by Ohio EPA. Documentation of this training will be provided in the revised Phase RFI report.

96. *Appendix F, Analytical Data Validation Summaries.*

- a. *Appendix F and Appendix H. The data validation summary for SDG-8 (dated December 20, 2002) indicates that lead and tin data from this group had results that were biased high and qualified with a "K." These samples were qualified with a "J" in Table H-1. These samples are among those taken to represent background concentrations for soil. ESOI must submit all laboratory QA/QC information associated with these samples and their analysis. Biased high background samples leave open the possibility of screening out site-related concentrations of inorganics as attributable to natural background levels and could potentially be not properly protective of receptors.*

The data validation memo dated December 20, 2002 was revised on April 17, 2003 to correct the data qualifiers from those listed in the Region III guidance (e.g., "K") to those specified by the approved QAPP (e.g., "J") which is why they are listed in Table H-1 as qualified with a "J". The requested laboratory QA/QC will be provided with the revised Phase I RFI report.

- b. *Appendix F of Volume 2 presents data validation summaries which indicate a number of problems associated with the RFI data (e.g., holding time exceedances) which were evaluated using Region III guidance from 1994 and 1995. Newer versions of the National Functional Guidelines (NFGs, U.S.EPA, 1999 and 2002) have been issued and Ohio has also issued data validation guidance (Ohio EPA, 2003a), based on SW-846 methods and the National Functional Guidelines. Since the facility is not in Region III and newer federal and State of Ohio (Ohio EPA 2003a) data validation guidance exist, the most current guidance should be used to validate the ESOI data.*

Additionally, the laboratory QAPP submitted as part of the RFI Work Plan (Appendix A, Attachment 3) addresses some of these same issues (e.g., holding times for organic samples). ESOI shall revise the Phase I report to reflect adherence to the procedures prescribed in the laboratory QAPP.

Section 9.2.2 of the approved QAPP states that the data will be validated using Region III guidance documents as well as the National Functional Guidelines. The RFI data were evaluated accordingly. It is inappropriate to suggest that ESOI utilize guidance other than those specified within the approved RFI Work Plan and/or guidance that were not available during the timeframe when most, if not all, of the field work and data validation were occurring.

- c. *Appendix F indicates problems with surrogate recoveries for organics methods (e.g.,*

SDG-3, 6, 13, 16, 17, 18, etc.). U.S.EPA National Functional Guidelines for Organic Data Review (1999) and SW-846 Method 8000b (which addresses surrogate recoveries for 8260B and 8270C) indicate that if surrogate recovery is not within established limits, and no instrument problem is found, the sample should be re-extracted and re-analyzed (or just re-analyzed for 8260B). The data summaries do not indicate re-analysis was performed when these surrogates were out of established limits and do not indicate that instrument problems were found. The National Functional Guidelines for Organic Data Review (October 1999) indicate, "the laboratory failed to perform acceptably if system monitoring compounds are outside criteria with no evidence of re-analysis."

Did the laboratory perform re-analyses as indicated by the method(s)? If so, document the results. If not, explain why not and how - if ESOI plans to make use of the data - they can attest to its usability given the specific QC problems with that sample and its purpose within the RFI.

There were no problems with the laboratory instrumentation. If the surrogate recoveries were found to be outside acceptable limits during the initial analysis, the samples were reanalyzed by BEC. This was completed in accordance with the laboratory SOPs included within the approved QAPP. If the surrogate recoveries were outside acceptable limits upon reanalysis, BEC concluded that the unacceptable surrogate recoveries were due to matrix interference and reported the results of the reanalysis. ESOI informed USEPA and Ohio EPA prior to the start of the RFI that matrix interference may become an issue due to the nature of the constituents expected to be found.

- d. ESOI should submit complete laboratory QC data for the Otter Creek sediment samples to allow for an assessment of data validation procedures (using a subset of the entire data set) completed by Mannik & Smith. This submittal should include bench sheets (e.g., moisture analysis, SVOC extraction, etc.), raw data for samples and QC samples, surrogate information, sample receipt form(s), data narrative(s), internal standards information, chromatograms, etc. And information associated with any sample re-analysis.*

The requested laboratory QA/QC data will be provided with the revised Phase I report.

- e. Validation Summaries. Data validation summaries (e.g., SDG-4, 6, 11, 14, 17, 18, etc.) indicate that holding times for organic analyses only apply to water samples and that holding times for sediments/soils are "currently under review" (since Region III guidances were published in 1994/1995). They further state that samples' results don't become "J" qualified until holding times are exceeded by at least double. As referenced above, NFGs and/or Ohio guidance should be used to assess the data including holding times. Additionally, the laboratory QAPP submitted with the RFI Work Plan indicates that holding times will be followed for organic methods (not differentiated by media type). Specific dates should be provided for date of sample collection and dates of holding times for analysis (and sample extraction*

when applicable). At a minimum, RFI Phase I samples that failed to meet the organic method standards in the approved QAPP shall be qualified accordingly and the Phase II investigation shall be revised accordingly.

Refer to the response to Specific Comment-94b with regard to data validation guidance.

With regard to the portion of the comment related to the "J" flag for data associated with samples which had exceeded their technical holding times, *Innovative Approaches to Data Validation, United States Environmental Protection Agency, Regions III* (June 1995) states: "If technical holding times are grossly exceeded (e.g., by greater than two times the required time for volatiles) either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the samples." Based the requirements of the approved QAPP and the professional judgement of the data Validator, the data were appropriately qualified.

- f. Summary for SDG-27, Addendum 2. This summary indicates that samples were analyzed for 6 PAHs using GC/MS/SIM. ESOI shall revise the Phase I Report to specify why this was done (here and in other SDGs), how the specific PAHs were selected, and what the results of this alternate method (SIM) indicate.*

Section 7.2 of the approved QAPP states that water samples to be analyzed for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene and ideno(1,2,3-cd)pyrene would be analyzed using selective ion monitoring (SIM). The SIM was used to meet the detection limit requirements for these compounds, as required by USEPA for this project.

- g. Summary for SDG-26. This summary indicates that herbicide holding times were not met (a separate issue) due to the lack of Diazald, a compound used to derivatize the herbicides. 1-Methyl-3-nitro-1-nitrosoguanidine was used in place of the Diazald. ESOI must submit information regarding the acceptability of this substitute (e.g., U.S. EPA guidance, etc.) or other information verifying this compound was as effective as Diazald (e.g., published literature describing a study of comparison).*

The U.S. Department of Transportation has re-classified Diazald as an explosive, therefore none of the suppliers were able to ship the material. BEC contacted Mr. Alan Debus, Region V QA Manager, who suggested that BEC follow Method 8151A. BEC was not able to obtain acceptable QC results using this method. BEC then determined that 1-Methyl-3-nitro-1-nitrosoguanidine could be used to produce diazomethane which could then be used as a derivatizing agent. BEC was able to obtain acceptable QC results using 1-Methyl-3-nitro-1-nitrosoguanidine as a substitute for Diazald.

97. Appendix H, Evaluation of Background Soil Concentration for Metals.

- a. Appendix H, Evaluation of Background Soil Concentrations for Metals.*

Background samples should be taken from the same soil strata (when possible - i.e., that strata is a local/native soil type) as the samples they are being compared to. Taking background samples from a variety of soil types/strata would likely give more spread to the data which would statistically generate higher (less conservative) background values. Because of the possibility of artificially elevated background values, this approach is unacceptable. Background data should be segregated by soil strata. The purpose of generating a background value is to make an estimate of naturally occurring levels for that soil type. Levels exceeding these background values are presumed to result from anthropogenic influences. As such, these soils must pass risk assessment for their designated uses. This risk level must be assessed based on total concentrations present for all metals not screened out using site-specific background values (calculated following established procedures in U.S. EPA guidance). If all background samples were taken from the same strata and that strata is comparable to all other site-related samples from local/native soils, document that in the RFI report. Assessment of strata can be augmented through the use of other soil parameters such as TOC, pH, grain size distribution, iron content, calcium carbonate, etc.

- b. Page H-1, Paragraph 4. Background sample sets are not large enough to apply bootstrap methodology. Chernick (1999) indicates that "in many practical contexts, the number 30 is used as a "minimum" sample size." This text then goes on to recommend a minimum number of samples (n) of 50. An alternate statistical assessment is required for the smaller number of background samples available.*
- c. Page H-2, Paragraph 0. ESOI proposes to use the values presented on Table H-2 for the data evaluation. These values include the statistical outliers for which ESOI argues were carefully reviewed to determine whether there was a reasonable basis for excluding them from the calculations (e.g., laboratory error, data transcription error, inappropriate sampling location). ESOI determined that there was no reasonable basis for excluding the outliers.*

The use of the one detection of antimony as the background level is not permissible. This detection appears to be an outlier and may reflect anthropogenic influences. The same may be true for Cobalt, which has two detections significantly greater (10X) than the levels used for the undetected compounds (or may relate to soil strata differences). The minimal number of detects (at levels considerably above the non-detect level) do not define a distribution. ESOI should either make a more conservative assessment of background or justify that these samples reflect an actual background population through the collection of additional background samples (which should be linked with other soil assessment parameters to verify they are reflective of actual background soil strata).

Ohio EPA applied the following criteria to ESOI's background soil data set and determined that the outliers must be excluded since all of the criteria have not been met.

- 1. Was a bias identified by QA/QC? According to ESOI, no bias was identified.*

2. *Is the outlier an order of magnitude greater than the mean of the other background data points? Yes for antimony.*
3. *Does the outlier produce a statistical limit above the risk-based standard? ESOI's risk based standards are not acceptable so this question was not evaluated.*
4. *Does the outlier fall within the range of regional background? ESOI did not site any regional data supporting that the outlier data falls within acceptable background range. Data from The Ohio State University (OSU 1983) is available for copper, cadmium, lead, nickel, zinc and chromium. ESOI's data fell outside the range of regional background for chromium, copper, and lead.*

In addition, ESOI states that the "removal of the outlier concentrations does not have a significant effect on the 0.95 UCL values, except for antimony and cobalt if the maximum detected concentrations are considered outliers." Values are blank for "0.95 Bootstrap UCL" for these compounds. The text indicates that "for antimony and cobalt, the maximum detected concentrations are used to represent background levels because only a few samples had detectable concentrations." Please reference this statistical approach. Delete the outliers and use the Method Detection Limit or human health-based criteria and EDQLs, whichever are lower, for comparison to SWMU and AOC samples.

- a. The premise of the comment is incorrect. The purpose of the background samples is not to characterize the concentrations in each soil stratum. The purpose is to characterize the concentrations to which people would be exposed at the site if the ESOI facility did not exist. For this purpose, the background samples should characterize the distribution of concentration in surface soil of whatever types that exist at and around the facility. All background sample locations for this purpose were approved in the RFI Phase I Work Plan and agreed to by Ohio EPA in the field as being representative of site background conditions.
- b. All background soil statistics in the RFI Report (if calculated for a particular metal), including the nonparametric bootstrap confidence limits, were calculated based on 10 to 12 background samples. ESOI understands that USEPA Region 5 has determined that these samples sizes are sufficient for application of the nonparametric bootstrap method used by ENVIRON to calculate confidence limits on the mean. ESOI understands that USEPA made this determination in consultation with inventors of the bootstrap method (B. Efron and P. Hall) and based on discussions with ENVIRON for other recent RCRA corrective action work in EPA Region 5.
- c. Table SC97 (attached) compares the 95% UCL and statistical outliers to Ohio background ranges as published in Elements in North American Soil (Dragun and Chiasson). These comparisons show that the background values used in the RFI Report are consistent with the background ranges in Ohio soil as published in the literature. As shown on this table, all the 95% UCLs are well within the published ranges, except for lead and selenium. Lead has a 95% UCL of 39 mg/kg, which is only slightly higher than the published high-end of the range of 30 mg/kg. Lead also had one outlier (65 mg/kg) that is higher than the published range, although its effect on the 95% UCL was minimal as shown by the low 95% UCL value. Selenium has a 95% UCL of 3.2 mg/kg, which is only slightly higher than the high-end of the published range of 1.2

mg/kg. The selenium data set has no outliers.

Table SC97 also shows that the highest detected concentrations of antimony and cobalt are both well within the published ranges for these metals in Ohio soil. These values of antimony and cobalt were used because they were collected from approved background sampling locations, and therefore, were expected to represent background levels by definition. Additionally, comparison of these values to the published ranges showed that they are in fact reasonable background values.

In summary, the comparisons on the attached table provide no basis for modifying any of the background values used in the RFI Report, and in fact, show that they are in good agreement with the published literature.

December 12, 2003

RFI Phase I Soil Split Sample Comparison						
COC	Soil Sample Location: SWMU 5, T-22		Soil Sample Location: SWMU 5, T-21		Soil Sample Location: SWMU 5, T20	
	Ohio EPA Conc. mg/kg	ESOI Conc. mg/kg	Ohio EPA Conc. mg/kg	ESOI Conc. mg/kg	Ohio EPA Conc. mg/kg	ESOI Conc. mg/kg
Arsenic, Total	145	170	16.5	22	6.47	8.6
Barium	93.8	72	111	44	117	99
Beryllium, Total	0.669J	0.6	0.811	0.5	0.926	0.9
Cadmium, Total	1.77	1.6	1.70	U (0.05)	1.13	0.8
Cobalt, Total	5.04	U(2.5)	9.35	U (2.5)	12.8	U (2.5)
Chromium, Total	31.0	24	27.2	15	24.1	0.8
Copper, Total	99.7	74	36.1	23	20.2	24
Nickel, Total	24.3	23	32.8	34	29.3	23
Lead, Total	2010	1000	451	23	15.3	94
Tin, Total	7.51J	9.3	ND	3.5	ND	3.6
Vanadium, Total	30.1	23	34.4	19	41.7	33
Zinc	186	200	119	64	85.6	72
	Ohio EPA Sample ID: S-SWMU5-T22-090402 ESOI sample ID Number: S-F20C7P1-090402-NAB-151		Ohio EPA Sample ID: S-SWMU5-T21-090502-001 ESOI sample ID Number: S-F20C7P1-090502-NAB-153		Ohio EPA Sample ID: S-SWMU5-T-20-090502 ESOI Sample ID Number: S-F20C7P1-090502-NAB-158	

RFI Phase I Ground Water Split Sample Analysis Results

Well ID	Constituent	Ohio EPA Concentration µg/l		ESOI Concentration µg/l
T-5D	acetophenone	4.70 J		UJ (10)
	bis (2-ethylhexyl) phthalate	6.39		UJ (10)
	di-n-octyl phthalate	5.70	4.68 J	UJ (10)
	acetone	4.28 J	6.8 J	U (10)
	benzene	0.295 J		U (1)
	cyanide	7.64 J		U (10)
	sulfide, acid soluble	500 J		U (1000)
	boron total	803		NR
	strontium total	1320		NR
	aluminum total	1020		NR
	arsenic total	22.2		18
	barium total	93.2		67
	calcium total	13800		NR
	copper total	5.76 J		U (25)
	potassium total	68100		NR
	magnesium total	2510		NR
	manganese total	24.6		NR
	sodium total	97300		NR
	lead total	5.97		11
	zinc total	9.52 J		U (25)
	antimony total	.716 J		U (5)
	selenium total	1.49		19
	thallium total	0.24		U (4)
	boron dissolved	740		NR
	strontium dissolved	1080		NR
	aluminum dissolved	120		NR
	arsenic dissolved	5.86		17

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
T-5D	barium dissolved	37.3	U (50)
	calcium dissolved	4730	NR
	copper dissolved	5.33 J	U (25)
	potassium dissolved	70100	NR
	magnesium dissolved	1290	NR
	manganese dissolved	3.81 J	NR
	selenium dissolved	1.46	19
	thallium dissolved	0.243	U (4)
T-11D	boron total	1110	NR
	aluminum total	14500	NR
	barium total	227	310
	beryllium total	1.09 J	U (1)
	calcium total	59600	NR
	cobalt total	10.1 J	U (50)
	chromium total	21.5	56
	copper total	17.7 J	U (25)
	potassium total	13900	NR
	magnesium total	15.4	NR
	manganese total	320	NR
	sodium total	61.2	NR
	nickel total	24.5	45
	lead total	13.3	7.4
	vanadium total	30	96
	zinc total	51.7	U (25)
	arsenic total	25.9	U (10)
	strontium total	2220	NR
	antimony total	0.504 J	U (5)
	selenium total	1.51	9.6

Well ID	Constituent	Ohio EPA Concentration µg/l		ESOI Concentration µg/l
	thallium total		0.443	U (4)
T-11D	boron dissolved		925	NR
	barium dissolved		70.6	79
	calcium dissolved		9230	NR
	potassium dissolved		9030	NR
	magnesium dissolved		5460	NR
	manganese dissolved		1.39 J	NR
	sodium dissolved		56600	NR
	strontium dissolved		1840	NR
	antimony dissolved		0.535 J	U (5)
	selenium dissolved		1.82	14
	thallium dissolved		0.139	U (4)
	cyanide		5.09 J	U (10)
T-20S	bis (2-ethylhexyl) phthalate	10100 Dup 9950	4660 I 11600	396 J
	phenanthrene		188	10.86
	pyrene		139 J	R
	Acetone		10.7 J	UJ (10)
T-20D	4,4'-DDT		0.0589 J	U (0.1)
	di-n-octyl phthalate		13.0	UJ (10)
T-37D	mercury total		0.075 J	U (0.2)
	boron total		1030	NR
	strontium total		2390	NR
	aluminum total		66800	NR
	arsenic total		35.9	31
	barium total		547	490
	beryllium total		3.6 J	3.1
	cobalt total		53.6	U (50)

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	chromium total	110	87.11
T-37D	copper total	125	60
	potassium total	18700	NR
	magnesium total	78600	NR
	manganese total	2230	NR
	sodium total	64000	NR
	nickel total	124	87
	lead total	68.3	44
	vanadium total	109	120
	zinc total	273	160
	calcium total	485000	NR
	antimony total	3.03	U (5)
	selenium total	4.04	37
	thallium total	1.89	U (4)
	boron dissolved	1030	NR
	strontium dissolved	1360	NR
	aluminum dissolved	276	NR
	barium dissolved	56.4	59
	calcium dissolved	13500	NR
	potassium dissolved	1860	NR
	magnesium dissolved	4540	NR
	manganese dissolved	33.7	NR
	sodium dissolved	58200	NR
	zinc dissolved	17.2 J	U (25)
	antimony dissolved	3.98	18
	selenium dissolved	1.11	U (25)
T-37S	benzene	0.164 J	U (1)
	ethyl benzene	0.337 J	U (1)

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	tetrahydrofuran	9.62 J	10.8
	toluene	2.01 J	U (1)
T-54S	acetophenone	32.3	68.9J
	di-n-octyl phthalate	6.9	UJ (10)
	benzene	0.283 J	U (1)
	tetrachloroethene	1.29 J	U (1)
	toluene	0.48 J	U (1)
	boron total	344	NR
	aluminum total	29100	NR
	barium total	245	350
	beryllium total	2.58 J	U (1)
	calcium total	313000	NR
	cobalt total	15.4 J	U (50)
	chromium total	41.2	69
	copper total	54.6	U (25)
	potassium total	12600	NR
	magnesium total	159000	NR
	manganese total	1740	NR
	nickel total	45.8	61
	lead total	33.6	27
	strontium total	1960	NR
	vanadium total	59.9	140
	zinc total	108	130
	arsenic total	31.8	37
	sodium total	143000	NR
	antimony total	0.991 J	U (5)
	selenium total	5.31	36
	thallium total	1.14	U (4)

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	boron dissolved	247	NR
	aluminum dissolved	74.8 J	NR
	barium dissolved	29.7	U (50)
T-54S	calcium dissolved	244000	NR
	potassium dissolved	4400	NR
	magnesium dissolved	141	NR
	manganese dissolved	1180	NR
	nickel dissolved	6.63 J	U (25)
	lead dissolved	4.03 J	U (5)
	strontium	1870	NR
	zinc dissolved	6.45 J	U (25)
	sodium dissolved	141000	NR
	antimony dissolved	1.18	U (5)
	selenium dissolved	4.83	18
	thallium dissolved	0.49	U (4)
BG-1D	aluminum total	1340	NR
	boron total	888	NR
	barium total	62.7	75
	calcium total	12300	NR
	copper total	7.6 J	U (25)
	potassium total	17200	NR
	magnesium total	6190	NR
	manganese total	32.2	NR
	sodium	71500	NR
	strontium total	1740	NR
	zinc total	9.69	U (25)
	arsenic total	2.59 J	U (10)
	lead total	2.57 J	U (5)

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	antimony total	0.866 J	U (5)
	selenium total	1.04	16
	thallium total	0.162 J	U (4)
	aluminum dissolved	170	NR
BG-1D	boron dissolved	853	NR
	barium dissolved	58.9	U (50)
	calcium dissolved	8680	NR
	copper dissolved	9.45	U (25)
	potassium dissolved	16800	NR
	magnesium dissolved	5370	NR
	manganese dissolved	3.02 J	NR
	sodium dissolved	73800	NR
	strontium dissolved	1720	NR
	zinc dissolved	6.45 J	U (25)
	antimony dissolved	0.805 J	U (5)
	selenium dissolved	0.991 J	13
	thallium dissolved	0.114 J	U (4)
BR-1R	aluminum total	222	NR
	boron total	497	NR
	barium total	34.8	U (50)
	calcium total	77300	NR
	copper total	6.47 J	U (25)
	potassium total	5430	NR
	magnesium total	11300	NR
	manganese total	15.7	NR
	sodium	66300	NR
	strontium total	8550	NR
	zinc total	8.51 J	U (25)

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	Antimony total	0.5 J	U (5)
	aluminum dissolved	301	NR
	boron dissolved	490	NR
	barium dissolved	33	U (50)
	calcium dissolved	71900	NR
BG-1R	copper dissolved	5.43 J	U (25)
	potassium dissolved	5210	NR
	magnesium dissolved	10200	NR
	manganese dissolved	14.8	NR
	sodium dissolved	63900	NR
	strontium dissolved	8080	NR
	zinc dissolved	7.41 J	U (25)
Constituents are only listed if they were detected by Ohio EPA. J= estimated value NR= No Result Reported U()= not detected with the sample quantitation limit in parentheses R= Rejected			

PHASE II WORK PLAN

5.1 Summary of Phase II Sampling Plan

1. *Page 116 of the Phase II Work Plan recommends limited additional sampling, which is specified in Work Plan Table 5.1 and Figure 5.1. No assessment of ecological risks is proposed or discussed in the Phase II Work Plan. Page 4-13 of the Phase I Work Plan states that “if the results of the screening level analysis do indicate that a more detailed assessment of ecological risk is appropriate, then a Work Plan will be prepared.” Despite substantial risks with some hazard quotients (HQs) greater than 100 (e.g., Phase I RFI Report, Table 4.12, mercury exceeds the screening level by 1500 times), the Phase II Work Plan does not provide any recommendations for “a more detailed assessment of ecological risk.”*

Prior to proceeding with a Phase II Work Plan, the following are recommended:

- (1) *A screening ERA should be performed to identify COPCs according to current EPA*

guidance. The ERA should include an analysis of uncertainties and data gaps that should be used to guide future investigation activities.

- (2) The additional ecological risk assessment issues identified in this technical review should also be addressed in a revised Phase I Report.*

A screening level ERA will be conducted after the completion of supplemental field sampling activities designed to fill data gaps and reduce uncertainties in the risk assessment. If the results of the screening level analysis indicate that a more detailed assessment of ecological risk is appropriate, then a Work Plan will be prepared for agency review before proceeding, as indicated in the Phase I Work Plan.

- 2. Any proposed sampling locations should be presented on larger scale maps for individual AOCs, IAs, and SWMUs. Only ERA specific samples should be shown (e.g., do not include any subsurface soil samples that would not be used in the ERA). The current large format map (43 x 36 in) is difficult to review, particularly in electronic format, and the current sampling locations could not be adequately evaluated. Sample locations to support the ERA should be shown in separate figures for each AOC, IA, and SWMU investigated. The information in Table 5-1 should be provided in separate ecological and human health risk assessments tables that address data gaps (i.e., only include groundwater samples (near surface water) and soil (surficial only) that will be used in the ERA).*

Separate maps will be provided for additional sampling associated with ecological screening vs. that proposed based on human health screening.